INTREXON CORP
Form 10-Q
November 08, 2018
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-Q
x QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the quarterly period ended September 30, 2018
OR
¨ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to .
Commission File Number: 001-36042
INTREXON CORPORATION
(Exact name of registrant as specified in its charter)

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

(301) 556-9900
(Registrant's telephone number, including area code)
(Former name, former address and former fiscal year, if changed since last report date)
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No ¨
Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes x No ¨
Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	x	Accelerated filer	¨
Non-accelerated filer	¨	Smaller reporting company	¨
Emerging growth company	¨		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ¨
Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ¨ No x
As of October 31, 2018, 137,221,526 shares of common stock, no par value per share, were outstanding.

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INTREXON CORPORATION
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Intrexon®, Trans Ova Genetics®, Oxitec®, ViaGen®, EnviroFlight®, ActoBiotics®, AquAdvantage®, Design-Build-Test-Learn®, RheoSwitch® and RTS® are our and/or our affiliates' registered trademarks in the United States and AquaBounty™, GenVec™, Precigen™, Precigen Therapeutics™, Okanagan Specialty Fruits™, Progentus™, ActoB Therapeutics™ and AdenoVerse™ are our and/or our affiliates' common law trademarks in the United States. This Quarterly Report on Form 10-Q, or Quarterly Report, 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 Quarterly Report 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 Quarterly Report are the property of their respective owners.

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Special Note Regarding Forward-Looking Statements

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

- our 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;
- 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, regulations and policies;
- the ability of our collaborators and licensees to adapt to changes in laws, 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 or investigations 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;

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- 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 on our current and future operating results.

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 Quarterly Report.

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

You should read this Quarterly Report, the documents that we reference in this Quarterly Report, our Annual Report on Form 10-K for the year ended December 31, 2017, the other reports we have filed with the Securities and Exchange Commission, or SEC, and the documents that we have filed as exhibits to our filings with the SEC 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.

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PART I. FINANCIAL INFORMATION
Item 1. Consolidated Financial Statements
Intrexon Corporation and Subsidiaries
Consolidated Balance Sheets
(Unaudited)

(Amounts in thousands, except share data)	September 30, 2018	December 31, 2017
Assets		
Current assets		
Cash and cash equivalents	$ 82,417	$ 68,111
Restricted cash	6,987	6,987
Short-term investments	164,162	6,273
Equity securities	714	5,285
Receivables		
Trade, net	18,161	19,775
Related parties, net	8,841	17,913
Other	3,305	2,153
Inventory	18,294	20,493
Prepaid expenses and other	7,589	7,057
Total current assets	310,470	154,047
Equity securities, noncurrent	3,983	9,815
Investments in preferred stock	158,421	161,225
Property, plant and equipment, net	122,707	112,674
Intangible assets, net	213,244	232,877
Goodwill	151,276	153,289
Investments in affiliates	17,944	18,870
Other assets	2,370	4,054
Total assets	$ 980,415	$ 846,851

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

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Intrexon Corporation and Subsidiaries
Consolidated Balance Sheets
(Unaudited)

(Amounts in thousands, except share data)	September 30, 2018	December 31, 2017
Liabilities and Total Equity		
Current liabilities		
Accounts payable	$ 8,522	$ 8,701
Accrued compensation and benefits	23,885	6,474
Other accrued liabilities	20,998	21,080
Deferred revenue, including $16,967 and $29,155 from related parties as of September 30, 2018 and December 31, 2017, respectively	38,036	42,870
Lines of credit	200	233
Current portion of long-term debt	546	502
Related party payables	143	313
Total current liabilities	92,330	80,173
Long-term debt, net of current portion, including $30,060 and $0 to related parties as of September 30, 2018 and December 31, 2017, respectively	183,133	7,535
Deferred revenue, net of current portion, including $115,885 and $157,628 from related parties as of September 30, 2018 and December 31, 2017, respectively	136,942	193,527
Deferred tax liabilities, net	9,363	15,620
Other long-term liabilities	3,204	3,451
Total liabilities	424,972	300,306
Commitments and contingencies (Note 16)		
Total equity		
Common stock, no par value, 200,000,000 shares authorized as of September 30, 2018 and December 31, 2017; 137,144,902 and 122,087,040 shares issued and outstanding as of September 30, 2018 and December 31, 2017, respectively	—	—
Additional paid-in capital	1,552,379	1,397,005
Accumulated deficit	(990,080)	(847,820)
Accumulated other comprehensive loss	(22,900)	(15,554)
Total Intrexon shareholders' equity	539,399	533,631
Noncontrolling interests	16,044	12,914
Total equity	555,443	546,545
Total liabilities and total equity	$ 980,415	$ 846,851

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

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Operations
(Unaudited)

(Amounts in thousands, except share and per share data)	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Revenues				
Collaboration and licensing revenues, including $11,952 and $24,492 from related parties during the three months ended September 30, 2018 and 2017, respectively, and $41,740 and $77,937 during the nine months ended September 30, 2018 and 2017, respectively	$14,324	$28,155	$51,622	$89,384
Product revenues	6,829	7,670	23,549	25,780
Service revenues	10,414	9,975	40,379	37,890
Other revenues	881	216	1,839	899
Total revenues	32,448	46,016	117,389	153,953
Operating Expenses				
Cost of products	8,877	8,001	28,046	25,625
Cost of services	6,449	7,013	21,127	21,805
Research and development	44,885	36,472	124,072	104,663
Selling, general and administrative	38,708	39,277	112,872	113,258
Total operating expenses	98,919	90,763	286,117	265,351
Operating loss	(66,471)	(44,747)	(168,728)	(111,398)
Other Income (Expense), Net				
Unrealized and realized appreciation (depreciation) in fair value of equity securities and preferred stock, net	(7,287)	2,175	(27,565)	9,240
Interest expense	(3,999)	(138)	(4,240)	(498)
Interest and dividend income	6,107	5,070	17,323	14,437
Other income (expense), net	1,452	(1,021)	571	4,453
Total other income (expense), net	(3,727)	6,086	(13,911)	27,632
Equity in net loss of affiliates	(2,870)	(2,993)	(9,880)	(11,273)
Loss before income taxes	(73,068)	(41,654)	(192,519)	(95,039)
Income tax benefit	14,322	818	19,535	2,164
Net loss	$(58,746)	$(40,836)	$(172,984)	$(92,875)
Net loss attributable to the noncontrolling interests	1,422	1,147	4,113	3,123
Net loss attributable to Intrexon	$(57,324)	$(39,689)	$(168,871)	$(89,752)
Net loss attributable to Intrexon per share, basic and diluted	$(0.44)	$(0.33)	$(1.31)	$(0.75)
Weighted average shares outstanding, basic and diluted	129,518,989	120,518,885	128,843,991	119,741,291

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

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Comprehensive Loss
(Unaudited)

	Three Months Ended September 30,		Nine Months Ended September 30,	
(Amounts in thousands)	2018	2017	2018	2017
Net loss	$(58,746)	$(40,836)	$(172,984)	$(92,875)
Other comprehensive income (loss):				
Unrealized gain (loss) on investments	(96)	79	(94)	74
Gain (loss) on foreign currency translation adjustments	(914)	7,410	(7,207)	19,405
Comprehensive loss	(59,756)	(33,347)	(180,285)	(73,396)
Comprehensive loss attributable to the noncontrolling interests	1,380	1,129	4,172	3,096
Comprehensive loss attributable to Intrexon	$(58,376)	$(32,218)	$(176,113)	$(70,300)

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

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Shareholders' and Total Equity
(Unaudited)

(Amounts in thousands, except share data)	Common Stock Shares	Amount	Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total Intrexon Shareholders Equity	Noncontrolling Interests	Total Equity
Balances at December 31, 2017	122,087,040	$ —	$1,397,005	$ (15,554)	$ (847,820)	$ 533,631	$ 12,914	$ 546,545
Cumulative effect of adoption of ASC 606	—	—	—	(104)	26,611	26,507	—	26,507
Stock-based compensation expense	—	—	28,251	—	—	28,251	89	28,340
Shares issued upon vesting of restricted stock units and for exercises of stock options and warrants	66,314	—	262	—	—	262	812	1,074
Shares issued as payment for services	612,117	—	8,404	—	—	8,404	—	8,404
Shares and warrants issued in public offerings, net of issuance costs	6,900,000	—	82,374	—	—	82,374	5,616	87,990
Equity component of convertible debt, net of issuance costs and deferred taxes	—	—	36,868	—	—	36,868	—	36,868
Shares issued pursuant to share lending agreement	7,479,431	—	—	—	—	—	—	—
Adjustments for noncontrolling interests	—	—	(785)	—	—	(785)	785	—
Net loss	—	—	—	—	(168,871)	(168,871)	(4,113)	(172,984)
Other comprehensive loss	—	—	—	(7,242)	—	(7,242)	(59)	(7,301)
Balances at September 30, 2018	137,144,902	$ —	$1,552,379	$ (22,900)	$ (990,080)	$ 539,399	$ 16,044	$ 555,443

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

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Cash Flows
(Unaudited)

	Nine Months Ended September 30,	
(Amounts in thousands)	2018	2017
Cash flows from operating activities		
Net loss	$(172,984)	$(92,875)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	25,184	22,881
Loss on disposal of assets, net	4,110	1,311
Write-off of in-process research and development acquired in asset acquisition	8,721	—
Unrealized and realized (appreciation) depreciation on equity securities and preferred stock, net	27,565	(9,240)
Noncash dividend income	(14,575)	(12,303)
Amortization of premiums (discounts) on investments, net	(275)	411
Equity in net loss of affiliates	9,880	11,273
Stock-based compensation expense	28,340	31,949
Shares issued as payment for services	8,404	8,440
Provision for bad debts	1,597	1,093
Accretion of debt discount and amortization of deferred financing costs	2,116	—
Deferred income taxes	(19,335)	(2,294)
Other noncash items	635	(1,848)
Changes in operating assets and liabilities:		
Receivables:		
Trade	399	2,491
Related parties	6,085	(1,073)
Other	(909)	537
Inventory	2,577	3,418
Prepaid expenses and other	(511)	(516)
Other assets	584	(617)
Accounts payable	(731)	(3,756)
Accrued compensation and benefits	17,561	3,291
Other accrued liabilities	1,591	1,554
Deferred revenue	(22,993)	(35,281)
Deferred consideration	—	(313)
Related party payables	(167)	356
Other long-term liabilities	253	1,271
Net cash used in operating activities	(86,878)	(69,840)

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

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Cash Flows
(Unaudited)

(Amounts in thousands)	Nine Months Ended September 30, 2018	2017
Cash flows from investing activities		
Purchases of investments	(178,681)	—
Maturities of investments	20,975	136,300
Purchases of preferred stock and warrants	—	(1,161)
Proceeds from sales of equity securities	217	235
Cash acquired in business combination	—	2,054
Investments in affiliates	(14,139)	(10,639)
Return of investment in affiliate	2,598	—
Cash received (paid) in asset acquisition	15,500	(14,219)
Purchases of property, plant and equipment	(30,354)	(32,675)
Proceeds from sale of assets	1,930	1,423
Issuances of notes receivable	—	(2,400)
Proceeds from repayment of notes receivable	—	1,500
Net cash provided by (used in) investing activities	(181,954)	80,418
Cash flows from financing activities		
Proceeds from issuance of shares and warrants in public offerings, net of issuance costs	87,990	—
Acquisitions of noncontrolling interests	—	(913)
Advances from lines of credit	3,231	4,563
Repayments of advances from lines of credit	(3,264)	(5,149)
Proceeds from long-term debt, net of issuance costs	194,000	285
Payments of long-term debt	(485)	(385)
Payments of deferred consideration for acquisition	—	(8,678)
Proceeds from stock option and warrant exercises	1,074	867
Payment of issuance costs	—	(10)
Net cash provided by (used in) financing activities	282,546	(9,420)
Effect of exchange rate changes on cash, cash equivalents, and restricted cash	578	892
Net increase in cash, cash equivalents, and restricted cash	14,292	2,050
Cash, cash equivalents, and restricted cash		
Beginning of period	75,545	69,594
End of period	$89,837	$71,644

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

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Intrexon Corporation and Subsidiaries
Consolidated Statements of Cash Flows
(Unaudited)

(Amounts in thousands)	Nine Months Ended September 30, 2018	2017
Supplemental disclosure of cash flow information		
Cash paid during the period for interest	$360	$534
Cash paid during the period for income taxes	193	497
Significant noncash financing and investing activities		
Stock and warrants issued in business combination	$—	$16,997
Stock issued to acquire noncontrolling interests	—	5,082
Long-term debt issued to a related party in an asset acquisition	30,000	—
Noncash dividend to shareholders	—	22,385
Purchases of property and equipment included in accounts payable and other accrued liabilities	2,088	2,137
Purchases of equipment financed through debt	193	—

The following table provides a reconciliation of the cash, cash equivalents, and restricted cash balances as of September 30, 2018 and December 31, 2017 as shown above:

	September 30, 2018	December 31, 2017
Cash and cash equivalents	$ 82,417	$ 68,111
Restricted cash	6,987	6,987
Restricted cash included in other assets	433	447
Cash, cash equivalents, and restricted cash	$ 89,837	$ 75,545

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

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

1. Organization

Intrexon Corporation ("Intrexon"), a Virginia corporation, including through its wholly owned subsidiaries Precigen, Inc. ("Precigen") and ActoBio Therapeutics, Inc. ("ActoBio"), uses synthetic biology to focus on programming biological systems to alleviate disease, remediate environmental challenges, and provide sustainable food and industrial chemicals, which may be accomplished through collaborations and joint ventures. Intrexon's primary domestic operations are in California, Florida, Maryland, and Virginia, and its primary international operations are in Belgium and Hungary. There have been no commercialized products derived from Intrexon's collaborations to date.

Trans Ova Genetics, L.C. ("Trans Ova"), and Progentus, L.C. ("Progentus"), providers of advanced reproductive technologies, including services and products sold to cattle breeders and other producers, are wholly owned subsidiaries with primary operations in Iowa, Maryland, Missouri, New York, Oklahoma, and Texas.

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

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

ViaGen, L.C. ("ViaGen"), a provider of genetic preservation and cloning technologies, and Exemplar Genetics, LLC ("Exemplar"), a provider of genetically engineered swine for medical and genetic research, are wholly owned subsidiaries with primary operations in Iowa.

In January 2018, AquaBounty Technologies, Inc. ("AquaBounty"), a company focused on improving productivity in commercial aquaculture, completed an underwritten public offering that resulted in net proceeds of $10,616 after deducting discounts, fees and expenses. As part of this offering, Intrexon purchased $5,000 of additional AquaBounty common stock, reducing its ownership stake from approximately 58% to approximately 53%. As of September 30, 2018, Intrexon owned approximately 52% of AquaBounty.

Intrexon and its consolidated subsidiaries are hereinafter referred to as the "Company."

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying interim consolidated financial statements are unaudited and have been prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP"). Certain information and footnote disclosures normally included in the Company's annual financial statements have been condensed or omitted. These interim consolidated financial statements, in the opinion of management, reflect all normal recurring adjustments necessary for fair statement of the Company's financial position as of September 30, 2018 and results of operations and cash flows for the interim periods ended September 30, 2018 and 2017. The year-end consolidated balance sheet data was derived from the Company's audited financial statements but does not include all disclosures required by U.S. GAAP. These interim financial results are not necessarily indicative of the results to be expected for the year ending December 31, 2018, or for any other future annual or interim period. The accompanying interim unaudited consolidated financial statements should be read in conjunction with the audited consolidated financial statements and related notes thereto included in the Company's Annual Report on Form 10-K for the year ended December 31, 2017 ("Annual Report").

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

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Revenue Recognition

Effective January 1, 2018, the Company applies Accounting Standards Codification ("ASC") Topic 606, Revenue from Contracts with Customers ("ASC 606"). Under ASC 606, the Company recognizes revenue when its customer obtains control of the promised goods or services, in an amount that reflects the consideration that the Company expects to receive in exchange for those goods or services. To determine revenue recognition for arrangements that are within the scope of ASC 606, the Company performs the following five steps: (i) identify the contract(s) with a customer, (ii) identify the promises and distinct performance obligations in the contract, (iii) determine the transaction price, (iv) allocate the transaction price to the performance obligations in the contract, and (v) recognize revenue when (or as) the Company satisfies the performance obligations.

The Company's revenue recognition accounting policies for periods prior to January 1, 2018 can be found in the audited consolidated financial statements and related notes thereto included in the Company's Annual Report.

Collaboration and licensing revenues

The Company generates collaboration and licensing revenues through the execution of agreements with collaborators (known as exclusive channel collaborations, "ECC" or "ECCs") and licensing agreements whereby the collaborators or the licensee obtain exclusive access to the Company's proprietary technologies for use in the research, development and commercialization of products and/or treatments in a contractually specified field of use. Generally, the terms of these agreements provide that the Company receives some or all of the following: (i) upfront payments upon consummation of the agreement; (ii) reimbursements for costs incurred by the Company for research and development and/or manufacturing efforts related to specific applications provided for in the agreement; (iii) milestone payments upon the achievement of specified development, regulatory and commercial activities; and (iv) royalties on sales of products arising from the collaboration or licensing agreement. The agreement typically continues in perpetuity unless terminated and each of the Company's collaborators retain a right to terminate the agreement upon providing the Company written notice a certain period of time prior to such termination, generally 90 days.

The Company's collaboration and licensing agreements typically contain multiple promises, including technology licenses, research and development services, and in certain cases manufacturing services. The Company determines whether each of the promises is a distinct performance obligation. As the nature of the promises in the Company's collaboration and licensing agreements are highly integrated and interrelated, the Company typically combines most of its promises into a single performance obligation. Because the Company is performing research and development services during early-stage development, the services are integral to the utilization of the technology license. Therefore, the Company has determined that the technology license and research and development services are typically inseparable from each other during the performance period of its collaboration and licensing agreements. Contingent manufacturing services that may be provided under certain of the Company's agreements are considered to be a separate future contract and not part of the current collaboration or licensing agreement.

At contract inception, the Company determines the transaction price, including fixed consideration and any estimated amounts of variable consideration. The upfront payment received upon consummation of the agreement is fixed and nonrefundable. Variable consideration is subject to a constraint and amounts are included in the transaction price to the extent that it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. Variable consideration may include reimbursements for costs incurred by the Company for research and development efforts, milestone payments upon the achievement of certain development, regulatory and commercial activities, and royalties on sales of products arising from the collaboration or licensing agreement. The Company determines the initial transaction price and excludes variable consideration that is otherwise constrained pursuant to the guidance in ASC 606.

The transaction price is allocated to the performance obligations in the agreement based on the standalone selling price of each performance obligation. The Company typically groups the promises in its collaboration and licensing agreements into one performance obligation so the entire transaction price relates to this single performance obligation. The technology license included in the single performance obligation is considered a functional license. However, it is typically combined into a single performance obligation as the Company provides interrelated research and development services along with other obligations over an estimated period of performance. The Company utilizes judgment to determine the most appropriate method to measure its progress of performance under the

agreement, primarily based on inputs necessary to fulfill the performance obligation. The Company evaluates its measure of progress to recognize revenue each reporting period and, if necessary, adjusts the measure of performance and related revenue recognition. The Company's measure of performance and revenue recognition involves significant judgment and assumptions, including, but not limited to, estimated costs and timelines to complete its performance

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obligations. The Company evaluates modifications and amendments to its contracts to determine whether any changes should be accounted for prospectively or on a cumulative catch-up basis.

Payments received for cost reimbursements for research and development efforts are recognized as revenue as the services are performed, in connection with the single performance obligation discussed above. The reimbursements relate specifically to the Company's efforts to provide services and the reimbursements are consistent with what the Company would typically charge other collaborators for similar services.

Milestone payments are evaluated at the inception of the agreement to determine whether the milestones are considered probable of being achieved. The Company typically determines that the milestones are not probable at inception of the agreement due to the uncertainty of when and if the milestone will be achieved.

Royalties, including sales-based milestones, received under the agreements will be recognized as revenue when sales have occurred because the Company applies the sales- or usage-based royalties recognition exception provided for under ASC 606. The Company determined the application of this exception is appropriate because at the time the royalties are generated, the technology license granted in the agreement is the predominant item to which the royalties relate.

As the Company receives upfront payments in its collaboration and licensing agreements, it evaluates whether any significant financing components exist in its collaboration and licensing agreements. Based on the nature of its collaboration and licensing agreements, there are no significant financing components as the purpose of the upfront payment is not to provide financing. The purpose is to provide the collaborator with assurance that the Company will complete its obligations under the contract or to secure the right to a specific product or service at the collaborator's discretion. In addition, the variable payments generally align with the timing of performance or the timing of the consideration varies on the basis of the occurrence or nonoccurrence of a future event that is not substantially within the control of the collaborator or the Company.

From time to time, the Company and certain collaborators may cancel their agreements, relieving the Company of any further performance obligations under the agreement. Upon such cancellation or when the Company has determined no further performance obligations are required of the Company under an agreement, the Company recognizes any remaining deferred revenue.

Product and service revenues

The Company generates product and service revenues primarily through sales of products and services that are created from technologies developed or owned by the Company. The Company's current offerings include sales of advanced reproductive technologies, including the Company's bovine embryo transfer and in vitro fertilization processes and from genetic preservation and sexed semen processes and applications of such processes to other livestock, as well as sales of livestock and embryos produced using these processes and used in production. As each promised product or service is distinct, the Company recognizes the transaction price as revenue when the customer takes ownership of the promised product or when the promised service is rendered. Payment terms are typically due within 30 days.

Equity Method Investments

The Company accounts for its investments in each of its joint ventures and for its investments in start-up entities backed by the Harvest Intrexon Enterprise Fund I, LP ("Harvest"), a related party, (Note 17) using the equity method of accounting based upon relative ownership interest. The Company's investments in these entities are included in investments in affiliates in the accompanying consolidated balance sheets. See additional discussion related to certain of the Harvest start-up entities in Note 3.

The Company accounts for its investment in Oragenics, Inc. ("Oragenics"), one of its collaborators and a related party, using the fair value option. The fair value of the Company's investment in Oragenics was $1,538 and $3,085 as of September 30, 2018 and December 31, 2017, respectively, and is included as equity securities, noncurrent, in the accompanying consolidated balance sheets. The Company's ownership of Oragenics was 7.9% and 29.4% as of September 30, 2018 and December 31, 2017, respectively. Unrealized appreciation (depreciation) in the fair value of these securities was $(387) and $827 for the three months ended September 30, 2018 and 2017, respectively, and $(1,547) and $(1,610) for the nine months ended September 30, 2018 and 2017, respectively. As of September 30, 2018, Oragenics was no longer considered an equity method investment as the Company's ownership level has significantly decreased during the three months ended September 30, 2018. See Note 7 for additional discussion

regarding Oragenics.

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Summarized financial data as of September 30, 2018 and December 31, 2017 and for the three and nine months ended September 30, 2018 and 2017, for the Company's equity method investments are shown in the following tables.

	September 30, 2018	December 31, 2017
Current assets	$ 21,044	$ 61,086
Noncurrent assets	27,827	13,598
Total assets	48,871	74,684
Current liabilities	5,324	6,213
Net assets	$ 43,547	$ 68,471

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Revenues	$113	$58	$353	$175
Operating expenses	11,621	9,693	30,762	33,128
Operating loss	(11,508)	(9,635)	(30,409)	(32,953)
Other, net	12	(145)	33	37
Net loss	$(11,496)	$(9,780)	$(30,376)	$(32,916)

Variable Interest Entities

As of September 30, 2018 and December 31, 2017, the Company determined that certain of its collaborators and joint ventures as well as Harvest were variable interest entities ("VIE" or "VIEs"). The Company was not the primary beneficiary for these entities since it did not have the power to direct the activities that most significantly impact the economic performance of the VIEs. The Company's aggregate investment balances of these VIEs as of September 30, 2018 and December 31, 2017 were $179,433 and $185,261, respectively, which represents the Company's maximum risk of loss related to the identified VIEs.

Convertible Notes

The Company allocated the proceeds received in July 2018 from the issuance of Intrexon's 3.50% convertible senior notes due 2023 (the "Convertible Notes") between long-term debt (liability component) and additional paid-in capital (equity component) within the consolidated balance sheet. The original value assigned to long-term debt is the estimated fair value as of the issuance date of a similar debt instrument without a conversion option. The original value assigned to additional paid-in capital represents the value of the conversion option and is calculated by deducting the fair value of the long-term debt from the principal amount of the Convertible Notes and is not remeasured as long as it continues to meet the requirements for equity classification. The original value of the conversion option will accrete to the carrying value of the long-term debt and result in additional non-cash interest expense over the expected life of the Convertible Notes using the effective interest method.

Debt issuance costs related to the Convertible Notes are also allocated between long-term debt and additional paid-in capital based on the original value assigned to each. Debt issuance costs allocated to long-term debt reduced the original carrying value and will accrete to the carrying value of the long-term debt and result in additional non-cash interest expense over the expected life of the Convertible Notes using the effective interest method. Debt issuance costs allocated to additional paid-in capital are recorded as reduction of the original value assigned to the conversion option.

See Note 12 for the further discussion of the Convertible Notes.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to both differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases as well as operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets

and liabilities of a change in tax rates is recognized in

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income in the period that includes the enactment date of the change. Valuation allowances are established when necessary to reduce deferred tax assets to the amount expected to be realized.

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

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (the "Tax Act") was signed into law and significantly revised U.S. corporate income tax law by, among other things, reducing the corporate income tax rate to 21% effective January 1, 2018, eliminating the corporate alternative minimum tax and implementing a modified territorial tax system that includes a one-time transition tax on deemed repatriated earnings from foreign subsidiaries. The U.S. Securities and Exchange Commission ("SEC") Staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared, or analyzed, including computations, in reasonable detail to complete the accounting for certain income tax effects of the Tax Act. The Company recognized provisional tax impacts related to revaluation of most of the Company's domestic deferred tax assets, the impact of revaluation of those deferred tax assets on the Company's valuation allowance and elimination of the corporate alternative minimum tax, and included those amounts in the consolidated financial statements for the year ended December 31, 2017. The actual impact of the Tax Act may differ from the Company's estimates due to, among other things, changes in interpretations and assumptions made, and guidance that may be issued as a result of the Tax Act.

In addition, the Tax Act implemented a new minimum tax on global intangible low-taxed income ("GILTI"). A company can elect an accounting policy to account for GILTI in either of the following ways:

- As a period charge in the future period in which the tax arises; or
- As part of deferred taxes related to the investment or subsidiary.

The Company has not made a policy decision regarding whether to record deferred taxes under the GILTI regime, and there was no impact to the accompanying consolidated financial statements as of and for the periods ended September 30, 2018.

The accounting is expected to be completed within the one-year measurement period as allowed by SAB 118 for items impacted or introduced by the Tax Act. See Note 13 for discussion of adjustments made to these provisional amounts in the nine months ended September 30, 2018.

Segment Information

While the Company generates revenues from multiple sources, including collaboration agreements, licensing, and products and services primarily associated with bovine reproduction, management is organized around a singular research and development focus to further the development of the Company's underlying synthetic biology technologies. Accordingly, the Company has determined that it operates in one segment. As of September 30, 2018 and December 31, 2017, the Company had $16,984 and $21,837, respectively, of long-lived assets in foreign countries. The Company recognized revenues derived in foreign countries totaling $2,235 and $4,448 for the three months ended September 30, 2018 and 2017, respectively, and $10,389 and $11,773 for the nine months ended September 30, 2018 and 2017, respectively.

Use of Estimates

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

Recently Adopted Accounting Pronouncements

The Company adopted ASC 606 for open contracts on January 1, 2018 using the modified retrospective approach. As a result of the adoption of ASC 606, including guidance on contract modifications, the Company recognized a cumulative catch-up adjustment to decrease deferred revenue in the net amount of $26,507 and accumulated deficit in

the net amount of $26,611 and to increase accumulated other comprehensive loss in the net amount of $104.

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In accordance with ASC 606, the disclosure of the impacted line items upon adoption of ASC 606 on the Company's consolidated statements of operations for the three and nine months ended September 30, 2018 and consolidated balance sheet as of September 30, 2018 was as follows:

	Three Months Ended September 30, 2018			Nine Months Ended September 30, 2018		
	As Reported	Balances Without Adoption of ASC 606	Effect of Change	As Reported	Balances Without Adoption of ASC 606	Effect of Change
Consolidated Statements of Operations						
Collaboration and licensing revenues	$14,324	$16,210	$(1,886)	$51,622	$58,305	$(6,683)
Net loss	(58,746)	(56,860)	(1,886)	(172,984)	(166,301)	(6,683)
Net loss attributable to Intrexon	(57,324)	(55,438)	(1,886)	(168,871)	(162,188)	(6,683)

	September 30, 2018		
	As Reported	Balances Without Adoption of ASC 606	Effect of Change
Consolidated Balance Sheet			
Liabilities			
Deferred revenue, current	$38,036	$39,594	$(1,558)
Deferred revenue, net of current portion	136,942	156,803	(19,861)
Total equity			
Accumulated deficit	(990,080)	(1,010,007)	19,927
Accumulated other comprehensive loss	(22,900)	(22,860)	(40)

In May 2017, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2017-09, Compensation-Stock Compensation (Topic 718) – Scope of Modification Accounting ("ASU 2017-09"). The provisions of ASU 2017-09 provide guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting in ASC Topic 718 ("ASC 718"). An entity should account for the effects of a modification unless (a) the fair value of the modified award is the same as the fair value of the original award, (b) the vesting conditions of the modified award are the same as the vesting conditions of the original award and (c) the classification of the modified award as an equity instrument or a liability instrument is the same as the classification of the original award immediately before the original award is modified. The Company adopted this standard effective January 1, 2018, and will apply this guidance to future modifications.

In November 2016, the FASB issued ASU 2016-18, Statement of Cash Flows (Topic 230) - Restricted Cash (A Consensus of the FASB Emerging Issues Task Force) ("ASU 2016-18"). The provisions of ASU 2016-18 require amounts generally described as restricted cash and restricted cash equivalents to be included with cash and cash equivalents when reconciling the total beginning and ending balances for the periods presented on the statement of cash flows. The Company adopted this standard effective January 1, 2018. In accordance with the provisions of ASU 2016-18, the "Cash, cash equivalents, and restricted cash" beginning period balance increased by $7,434 for the nine months ended September 30, 2018 in the accompanying consolidated statement of cash flows. The beginning and ending period balances increased by $6,987 and $7,428, respectively, in the accompanying consolidated statement of cash flows for the nine months ended September 30, 2017 from what was previously reported in the Company's Quarterly Report on Form 10-Q for the period ended September 30, 2017.

In October 2016, the FASB issued ASU 2016-16, Income Taxes (Topic 740) - Intra-Entity Transfers of Assets Other Than Inventory ("ASU 2016-16"). The provisions of ASU 2016-16 remove the prohibition in ASC Topic 740 against the immediate

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recognition of the current and deferred income tax effects of intra-entity transfers of assets other than inventory. The Company adopted this standard effective January 1, 2018, and the implementation of this standard did not have a material impact on the Company's consolidated financial statements.

In August 2016, the FASB issued ASU 2016-15, Statement of Cash Flows (Topic 230) - Classification of Certain Cash Receipts and Cash Payments ("ASU 2016-15"). The provisions of ASU 2016-15 address eight specific cash flow issues and how those certain cash receipts and cash payments are presented and classified in the statement of cash flows under ASC Topic 230 and other Topics. The Company adopted this standard effective January 1, 2018, and the implementation of this standard did not have a material impact on the Company's consolidated financial statements.

In January 2016, the FASB issued ASU 2016-01, Financial Instruments - Overall (Subtopic 825-10) - Recognition and Measurement of Financial Assets and Financial Liabilities ("ASU 2016-01"). The provisions of ASU 2016-01 make targeted improvements to enhance the reporting model for financial instruments to provide users of financial statements with more decision-useful information, including certain aspects of recognition, measurement, presentation, and disclosure of financial instruments. In February 2018, the FASB issued ASU 2018-03, Technical Corrections and Improvements to Financial Instruments-Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities, to clarify certain aspects of the guidance issued in ASU 2016-01. The Company adopted this standard effective January 1, 2018, and the implementation of this standard did not have a material impact on the Company's consolidated financial statements.

Recently Issued Accounting Pronouncements

In October 2018, the FASB issued ASU 2018-18, Collaborative Arrangements (Topic 808): Clarifying the Interaction between Topic 808 and Topic 606 ("ASU 2018-17"). The provisions of ASU 2018-18 clarify when certain transactions between collaborative arrangement participants should be accounted for under ASC 606 and incorporates unit-of-account guidance consistent with ASC 606 to aid in this determination. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2019, with early adoption permitted, and is effective for the Company for the year ending December 31, 2020. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In October 2018, the FASB issued ASU 2018-17, Consolidation (Topic 810): Targeted Improvements to Related Party Guidance for Variable Interest Entities ("ASU 2018-17"). The provisions of ASU 2018-17 modify the guidance under ASC Topic 810 related to the evaluation of indirect interests held through related parties under common control when determining whether fees paid to decision makers and service providers are variable interests. Indirect interests held through related parties that are under common control are no longer considered to be the equivalent of direct interests in their entirety and instead should be considered on a proportional basis. This guidance more closely aligns with accounting of how indirect interests held through related parties under common control are considered for determining whether a reporting entity must consolidate a VIE. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2019, with early adoption permitted, and is effective for the Company for the year ending December 31, 2020. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In August 2018, the SEC adopted final rules under SEC Release No. 33-10532, Disclosure Update and Simplification, to amend certain disclosure requirements that were redundant, duplicative, overlapping, outdated or superseded in light of other SEC disclosure requirements, U.S. GAAP or changes in the information environment. In addition, the amendments added a requirement for interim financial statements to disclose an analysis of changes in each caption of shareholders' equity presented in the balance sheet. Previously, this disclosure was only required in annual financial statements. Under the amendments, the analysis must be provided in a note or separate statement and should be accompanied by a reconciliation of the beginning balance to the ending balance of each period for which a statement of comprehensive income is required to be filed. This final rule was effective on November 5, 2018, except that companies may delay adoption of the rule relating to changes in shareholders' equity until the Form 10-Q for the quarter that begins after November 5, 2018. The Company will apply the amendments relating to changes in shareholders' equity in the Quarterly Report for the period ending March 31, 2019.

In August 2018, the FASB issued ASU 2018-15, Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract ("ASU 2018-15"). The provisions of ASU 2018-15 clarify the accounting for implementation costs of a hosting arrangement that is a service contract. The new standard requires an entity (customer) in a hosting arrangement that is a service contract to follow existing internal-use software guidance to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. Capitalized implementation costs of a hosting arrangement that is a service contract should be amortized over the term of the hosting arrangement, which might extend beyond the noncancelable period if

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there are options to extend or terminate. ASU 2018-15 also specifies the financial statement presentation of capitalized implementation costs and related amortization, in addition to required disclosures for material capitalized implementation costs related to hosting arrangements that are service contracts. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2019, with early adoption permitted, and is effective for the Company for the year ending December 31, 2020. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In August 2018, the FASB issued ASU 2018-13, Fair Value Measurements (Topic 820): Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurements ("ASU 2018-13"). The provisions of ASU 2018-13 modify the disclosures related to recurring and nonrecurring fair value measurements. Disclosures related to the transfer of assets between Level 1 and Level 2 hierarchies have been eliminated and various additional disclosures related to Level 3 fair value measurements have been added, modified or removed. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2019, but entities are permitted to early adopt either the entire standard or only the provisions that eliminate or modify the requirements. This standard is effective for the Company for the year ending December 31, 2020. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In June 2018, the FASB issued ASU 2018-07, Compensation-Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting ("ASU 2018-07"). The provisions of ASU 2018-07 expand the scope of ASC 718 to include share-based payment transactions for acquiring goods and services from nonemployees. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2018, with early adoption permitted no earlier than an entity's adoption date of ASC 606, and is effective for the Company for the year ending December 31, 2019. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In February 2018, the FASB issued ASU 2018-02, Income Statement-Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income ("ASU 2018-02"). The provisions of ASU 2018-02 allow a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Act. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2018, with early adoption permitted, and is effective for the Company for the year ending December 31, 2019. The amendments in ASU 2018-02 may be applied either in the period of adoption or retrospectively to each period (or periods) in which the effect of the change in the U.S. federal corporate income tax rate in the Tax Act is recognized. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In July 2017, the FASB issued ASU 2017-11, Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480) and Derivatives and Hedging (Topic 815): I. Accounting for Certain Financial Instruments with Down Round Features; II. Replacement of the Indefinite Deferral for Mandatorily Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatorily Redeemable Noncontrolling Interests with a Scope Exception ("ASU 2017-11"). The amendments in Part I of ASU 2017-11 change the classification analysis of certain equity-linked financial instruments (or embedded features) with down round features. When determining whether certain financial instruments should be classified as liabilities or equity instruments, a down round feature no longer precludes equity classification when assessing whether the instrument is indexed to an entity's own stock. The amendments also clarify existing disclosure requirements for equity-classified instruments. As a result, a freestanding equity-linked financial instrument (or embedded conversion option) no longer would be accounted for as a derivative liability at fair value as a result of the existence of a down round feature. For freestanding equity-classified financial instruments, the amendments require entities that present earnings per share ("EPS") in accordance with ASC Topic 260 ("ASC 260") to recognize the effect of the down round feature when it is triggered. That effect is treated as a dividend and as a reduction of income available to common shareholders in basic EPS. Convertible instruments with embedded conversion options that have down round features are now subject to the specialized guidance for contingent beneficial conversion features (in Subtopic 470-20, Debt-Debt with Conversion and Other Options),

including related EPS guidance (in ASC 260). The amendments in Part II of ASU 2017-11 re-characterize the indefinite deferral of certain provisions of ASC Topic 480 that now are presented as pending content in the FASB codification, to a scope exception. Those amendments do not have an accounting effect. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2018, with early adoption permitted, and is effective for the Company for the year ending December 31, 2019. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In June 2016, the FASB issued ASU 2016-13, Financial Instruments-Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments ("ASU 2016-13"). The provisions of ASU 2016-13 modify the impairment model to utilize an

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expected loss methodology in place of the currently used incurred loss methodology, and requires a consideration of a broader range of reasonable and supportable information to inform credit loss estimates. The guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2019, with early adoption permitted, and is effective for the Company for the year ending December 31, 2020. The Company is currently evaluating the impact that the implementation of this standard will have on the Company's consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842) ("ASU 2016-02"). The provisions of ASU 2016-02 set out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract (i.e. lessees and lessors). The new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight-line basis over the term of the lease, respectively. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than 12 months regardless of their classification. Leases with a term of 12 months or less will be accounted for in a similar manner as under existing guidance for operating leases today. ASU 2016-02 supersedes the previous lease standard, ASC Topic 840 ("ASC 840"), Leases. In July 2018, the FASB issued ASU 2018-10, Codification Improvements to Topic 842 (Leases), and ASU 2018-11, Leases (Topic 842), Targeted Improvements ("ASU 2018-11"), which provide (i) narrow amendments to clarify how to apply certain aspects of the new lease standard, (ii) entities with an additional transition method to adopt the new standard, and (ii) lessors with a practical expedient for separating components of a contract. ASU 2018-11 specifically permits an entity to elect an additional transition method to the existing modified retrospective transition requirements. Under the new transition method, an entity could adopt the provisions of ASU No. 2016-02 by recognizing a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption without adjustment to the financial statements for periods prior to adoption. Consequently, an entity's reporting for the comparative periods presented in the financial statements in which it adopts the new leases standard will continue to be in accordance with the previous lease guidance in ASC 840. ASU No. 2018-11 also allows a practical expedient that permits lessors to not separate non-lease components from the associated lease component if certain conditions are present. All of these ASUs related to ASC Topic 842 are effective for annual periods and interim periods within those annual periods beginning after December 15, 2018, and is effective for the Company for the year ending December 31, 2019. The Company is currently evaluating its lease agreements to determine the impact that the implementation of this standard will have on the Company's consolidated financial statements as it relates to the classification of leases under the dual approach and the recognition of a right-of-use asset and a lease liability as well as assessing the adoption method.

3. Mergers and Acquisitions

Asset Acquisition of Certain Harvest Entities

In September 2018, the Company, through its wholly owned subsidiary ActoBio, issued $30,000 of convertible promissory notes to Harvest, a related party, to acquire Harvest's ownership in CRS Bio, Inc., Genten Therapeutics, Inc., and Relieve Genetics, Inc. (collectively the "Harvest entities") (Note 17). The Company also received $15,500 cash in the transaction from the acquisition of the Harvest entities. Prior to the transaction, the Company held a noncontrolling interest in the Harvest entities, with a combined carrying value for all entities of $4,303, and accounted for its ownership using the equity method of accounting. Following the transaction, the Company owns 100% of the equity interests of the Harvest entities including the rights that had been previously licensed to the Harvest entities by the Company. The Harvest entities did not meet the definition of a business and accordingly, the transaction was accounted for as an asset acquisition.

By reacquiring the rights previously licensed to the Harvest entities, the Company is relieved from its obligations under the original ECCs and therefore wrote off deferred revenue of $10,078 as part of the transaction. The remaining value acquired of $8,721 was considered in-process research and development related to the reacquired rights under the ECCs and expensed immediately. No revenues were recognized under the ECCs with these entities during the three months ended September 30, 2018.

See additional discussion of the convertible promissory notes at Note 12.

GenVec Acquisition

In June 2017, pursuant to an Agreement and Plan of Merger (the "GenVec Merger Agreement"), the Company acquired 100% of the outstanding shares of GenVec, Inc. ("GenVec"), a clinical-stage company and pioneer in the development of AdenoVerse gene delivery technology. Pursuant to the GenVec Merger Agreement, the former shareholders of GenVec received an aggregate of 684,240 shares of the Company's common stock and have the right to receive contingent consideration equal to 50% of any milestone or royalty payments received under one of GenVec's collaboration agreements, provided such

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payments are received within three years after the closing of the transaction. The Company also assumed warrants held by certain former shareholders of GenVec. The results of GenVec's operations subsequent to the acquisition date have been included in the consolidated financial statements.

The fair value of the total consideration transferred was $17,582. The acquisition date fair value of each class of consideration transferred is presented below:

Common shares	$15,616
Warrants	1,381
Contingent consideration	585
	$17,582

The fair value of the shares of the Company's common stock issued was based on the quoted closing price of the Company's common stock immediately prior to the closing of the acquisition. The fair value of the warrants assumed was estimated using the Black-Scholes option-pricing model. The fair value of the contingent consideration was determined using a probability weighted discounted cash flows model and is considered a freestanding financial instrument and recorded at fair value each reporting period. The estimated fair value of assets acquired and liabilities assumed at the acquisition date is shown below:

Cash and cash equivalents	$2,054
Short-term investments	542
Trade receivables	75
Other receivables	97
Prepaid expenses and other	227
Property and equipment	250
Intangible assets	14,000
Other noncurrent assets	58
Total assets acquired	17,303
Accounts payable	2,158
Accrued compensation and benefits	1,226
Other accrued expenses	856
Other long-term liabilities	92
Deferred tax liabilities	239
Total liabilities assumed	4,571
Net assets acquired	12,732
Goodwill	4,850
Total consideration	$17,582

The acquired intangible assets include developed technology, the fair value of which was determined using the multi-period excess earning method, which is a variation of the income approach that converts future cash flows to single discounted present value amounts. The intangible assets are being amortized over a useful life of eleven years. Goodwill, which is not deductible for tax purposes, represents the assembled workforce and the anticipated buyer-specific synergies arising from the combination of the Company's and GenVec's technology.

Acquisition-related costs totaling $9 and $507 are included in selling, general and administrative expenses in the accompanying consolidated statements of operations for the three and nine months ended September 30, 2017, respectively.

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Condensed Pro Forma Financial Information

GenVec's results of operations subsequent to the acquisition are included in the consolidated statements of operations. The following condensed pro forma financial information for the nine months ended September 30, 2017 is presented as if the acquisition had been consummated on January 1, 2016:

	Nine Months Ended September 30, 2017 Pro forma
Revenues	$154,185
Loss before income taxes	(102,305)
Net loss	(100,330)
Net loss attributable to the noncontrolling interests	3,123
Net loss attributable to Intrexon	(97,207)

4. Investments in Joint Ventures

S & I Ophthalmic

In September 2013, the Company entered into a Limited Liability Company Agreement ("Sun LLC Agreement") with Sun Pharmaceutical Industries, Inc. ("Sun Pharmaceutical Subsidiary"), an indirect subsidiary of Sun Pharmaceutical Industries Ltd. ("Sun Pharmaceutical"), an international specialty pharmaceutical company focused on chronic diseases, to form S & I Ophthalmic, LLC ("S & I Ophthalmic"). The Sun LLC Agreement governed the affairs and the conduct of business of S & I Ophthalmic. S & I Ophthalmic leveraged experience and technology from both the Company and Sun Pharmaceutical. Both the Company and Sun Pharmaceutical Subsidiary made an initial capital contribution of $5,000 in October 2013 for a 50% membership interest in S & I Ophthalmic. S & I Ophthalmic was governed by a board of managers, which had four members, two each from the Company and Sun Pharmaceutical Subsidiary. In 2015, both the Company and Sun Pharmaceutical Subsidiary made subsequent capital contributions of $5,000.

In December 2017, both the Company and Sun Pharmaceutical Subsidiary agreed to dissolve S & I Ophthalmic and terminate the related ECC agreement. In January 2018, the Company received $2,598 upon the dissolution of S & I Ophthalmic, which represented the Company's portion of S & I Ophthalmic's remaining cash after all liabilities were settled.

OvaXon

In December 2013, the Company and OvaScience, Inc. ("OvaScience"), a life sciences company focused on the discovery, development, and commercialization of new treatments for infertility, entered into a Limited Liability Company Agreement ("OvaXon LLC Agreement") to form OvaXon, LLC ("OvaXon"), a joint venture to create new applications for improving human and animal health. Both the Company and OvaScience made an initial capital contribution of $1,500 in January 2014 for a 50% membership interest in OvaXon. OvaXon is governed by the OvaXon board of managers ("OvaXon Board"), which has four members, two each from the Company and OvaScience. In cases in which the OvaXon Board determines that additional capital contributions are necessary in order for OvaXon to conduct business and comply with its obligations, each of the Company and OvaScience has the right, but not the obligation, to make additional capital contributions to OvaXon subject to the OvaXon LLC Agreement. Through September 30, 2018, both the Company and OvaScience have made subsequent capital contributions of $4,350.

In March 2018, the Company and OvaScience agreed to terminate the ECC agreement with OvaScience. The Company and OvaScience are in discussions regarding the future of the OvaXon joint venture and the related ECC agreement.

The Company's investment in OvaXon was $140 and $146 as of September 30, 2018 and December 31, 2017, respectively, and is included in investments in affiliates in the accompanying consolidated balance sheets.

Intrexon Energy Partners

In March 2014, the Company and certain investors (the "IEP Investors"), including an affiliate of Third Security, LLC ("Third Security"), a related party, entered into a Limited Liability Company Agreement that governs the affairs and conduct of

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business of Intrexon Energy Partners, LLC ("Intrexon Energy Partners"), a joint venture formed to optimize and scale-up the Company's methane bioconversion platform ("MBP") technology for the production of certain fuels and lubricants. The Company also entered into an ECC with Intrexon Energy Partners providing exclusive rights to the Company's technology for the use in bioconversion, as a result of which the Company received a technology access fee of $25,000 while retaining a 50% membership interest in Intrexon Energy Partners. The IEP Investors made initial capital contributions, totaling $25,000 in the aggregate, in exchange for pro rata membership interests in Intrexon Energy Partners totaling 50%. In addition, Intrexon has committed to make capital contributions of up to $25,000, and the IEP Investors, as a group and pro rata in accordance with their respective membership interests in Intrexon Energy Partners, have committed to make additional capital contributions of up to $25,000, at the request of Intrexon Energy Partners' board of managers (the "Intrexon Energy Partners Board") and subject to certain limitations. As of September 30, 2018, the Company's remaining commitment was $5,132. Intrexon Energy Partners is governed by the Intrexon Energy Partners Board, which has five members. Two members of the Intrexon Energy Partners Board are designated by the Company and three members are designated by a majority of the IEP Investors. The Company and the IEP Investors have the right, but not the obligation, to make additional capital contributions above the initial limits when and if solicited by the Intrexon Energy Partners Board.

The Company's investment in Intrexon Energy Partners was $(506) and $(444) as of September 30, 2018 and December 31, 2017, respectively, and is included in other accrued liabilities in the accompanying consolidated balance sheets.

Intrexon Energy Partners II

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

The Company's investment in Intrexon Energy Partners II was $184 and $572 as of September 30, 2018 and December 31, 2017, respectively, and is included in investments in affiliates in the accompanying consolidated balance sheets.

EnviroFlight

In February 2016, the Company entered into a series of transactions involving EnviroFlight, LLC ("Old EnviroFlight"), Darling Ingredients Inc. ("Darling") and a newly formed venture between the Company and Darling ("New EnviroFlight"). New EnviroFlight was formed to generate high-nutrition, low environmental impact animal and fish feed, as well as fertilizer products, from black soldier fly larvae. Through September 30, 2018, both the Company and Darling have made subsequent capital contributions of $14,750.

The Company's investment in New EnviroFlight was $15,286 and $7,092 as of September 30, 2018 and December 31, 2017, respectively, and is included in investments in affiliates in the accompanying consolidated balance sheets.

Intrexon T1D Partners

In March 2016, the Company and certain investors (the "T1D Investors"), including affiliates of Third Security, entered into a Limited Liability Company Agreement that governs the affairs and conduct of business of Intrexon T1D Partners, LLC ("Intrexon T1D Partners"), a joint venture formed to utilize the Company's proprietary ActoBiotics platform to develop and commercialize products to treat type 1 diabetes. The Company also entered into an ECC with Intrexon T1D Partners that provides the exclusive rights to the Company's technology for use in the field, as a result of which the Company received a technology access fee of $10,000 while retaining a 50% membership interest in Intrexon T1D Partners. The T1D Investors

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made initial capital contributions, totaling $10,000 in the aggregate, in exchange for pro rata membership interests in Intrexon T1D Partners totaling 50%. Intrexon committed to make capital contributions of up to $5,000, and the T1D Investors, as a group and pro rata in accordance with their respective membership interests in Intrexon T1D Partners, committed to make additional capital contributions of up to $5,000, at the request of Intrexon T1D Partners' board of managers (the "Intrexon T1D Partners Board") and subject to certain limitations. As of September 30, 2018, the Company has satisfied its commitment. Intrexon T1D Partners is governed by the Intrexon T1D Partners Board, which has five members. Two members of the Intrexon T1D Partners Board are designated by the Company and three members are designated by a majority of the T1D Investors. The Company and the T1D Investors have the right, but not the obligation, to make additional capital contributions above these limits when and if solicited by the Intrexon T1D Partners Board.

The Company's investment in Intrexon T1D Partners was $0 and $(943) as of September 30, 2018 and December 31, 2017, respectively, and is included in other accrued liabilities in the accompanying consolidated balance sheets.

5. Collaboration and Licensing Revenue

The Company's collaborations and licensing agreements provide for multiple promises to be satisfied by the Company and typically include a license to the Company's technology platforms, participation in collaboration committees, and performance of certain research and development services. Based on the nature of the promises in the Company's collaboration and licensing agreements, the Company typically combines most of its promises into a single performance obligation because the promises are highly interrelated and not individually distinct. At contract inception, the transaction price is typically the upfront payment received and is allocated to the single performance obligation. The Company has determined the transaction price should be recognized as revenue based on its measure of progress under the agreement primarily based on inputs necessary to fulfill the performance obligation.

The Company recognizes the reimbursement payments received for research and development services in the period when the services are performed. At inception of each collaboration, the Company determines whether any milestone payments are probable and can be included in the transaction price. The milestone payments are typically not considered probable at inception and are therefore constrained under ASC 606. Royalties related to product sales will be recognized when sales have occurred since the royalties relate directly to the technology license granted in the agreement.

See Note 2 for additional discussion of the Company's revenue recognition policy related to collaboration and licensing payments.

The Company determines whether collaborations and licensing agreements are individually significant for disclosure based on a number of factors, including total revenue recorded by the Company pursuant to collaboration and licensing agreements, collaborators or licensees with either majority-owned subsidiaries or equity method investments, or other qualitative factors. Collaboration and licensing revenues generated from consolidated subsidiaries are eliminated in consolidation. Amounts for periods subsequent to January 1, 2018 reflect revenue recognition under ASC 606.

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The following tables summarize the amounts recorded as revenue in the consolidated statements of operations for each significant counterparty to a collaboration or licensing agreement for the three and nine months ended September 30, 2018 and 2017.

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
ZIOPHARM Oncology, Inc.	$4,826	$10,373	$13,626	$31,322
Oragenics, Inc.	705	475	867	1,519
Fibrocell Science, Inc.	391	1,683	1,015	5,375
Genopaver, LLC	689	1,422	3,076	4,615
S & I Ophthalmic, LLC	—	376	—	751
OvaXon, LLC	—	262	—	1,966
Intrexon Energy Partners, LLC	1,329	1,903	3,345	8,909
Persea Bio, LLC	199	266	714	821
Ares Trading S.A.	1,576	2,356	7,525	8,474
Intrexon Energy Partners II, LLC	754	816	1,685	2,921
Intrexon T1D Partners, LLC	368	1,462	2,399	3,882
Harvest start-up entities (1)	2,691	4,020	11,792	11,835
Other	796	2,741	5,578	6,994
Total	$14,324	$28,155	$51,622	$89,384

(1) For the three and nine months ended September 30, 2018 and 2017, revenues recognized from collaborations with Harvest start-up entities include: Thrive Agrobiotics, Inc.; Exotech Bio, Inc.; and AD Skincare, Inc. For the nine months ended September 30, 2018 and the three and nine months ended September 30, 2017, revenues recognized from collaborations with Harvest start-up entities also include Genten Therapeutics, Inc. and CRS Bio, Inc. For the three and nine months ended September 30, 2017, revenues recognized from collaborations with Harvest start-up entities also include Relieve Genetics, Inc.

Other than the termination of the OvaScience ECC in March 2018 (Note 4) and the asset acquisition regarding certain of the Harvest entities in September 2018 (Note 3), there have been no significant changes to the agreements with our collaborators and licensees in the nine months ended September 30, 2018. See also Note 19 for discussion of the Company's collaboration with ZIOPHARM Oncology, Inc. ("ZIOPHARM"). See Note 5 in the Company's Annual Report for additional details of the Company's existing collaboration and licensing agreements.

Deferred Revenue

Deferred revenue primarily consists of consideration received for the Company's collaborations and licensing agreements and prepayments for product and service revenues. Deferred revenue consists of the following:

	September 30, 2018	December 31, 2017
Collaboration and licensing agreements	$ 170,356	$ 231,583
Prepaid product and service revenues	3,119	4,681
Other	1,503	133
Total	$ 174,978	$ 236,397
Current portion of deferred revenue	$ 38,036	$ 42,870
Long-term portion of deferred revenue	136,942	193,527
Total	$ 174,978	$ 236,397

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The following table summarizes the remaining balance of deferred revenue associated with upfront and milestone payments for each significant counterparty to a collaboration or licensing agreement as of September 30, 2018 and December 31, 2017, including the estimated remaining performance period as of September 30, 2018.

	Average Remaining Performance Period (Years)	September 30, 2018	December 31, 2017
ZIOPHARM Oncology, Inc.	5.3	$ 51,084	$ 90,496
Oragenics, Inc.	5.7	6,240	6,719
Fibrocell Science, Inc.	6.1	17,846	16,607
Genopaver, LLC	5.5	1,346	1,704
Intrexon Energy Partners, LLC	5.5	13,164	15,625
Persea Bio, LLC	6.3	2,802	3,500
Ares Trading S.A.	5.6	34,608	40,789
Intrexon Energy Partners II, LLC	6.2	14,910	13,833
Intrexon T1D Partners, LLC	6.5	8,760	8,435
Harvest start-up entities (1)	6.4	8,007	18,400
Other	4.5	10,721	14,423
Total		$ 169,488	$ 230,531

(1) As of September 30, 2018 and December 31, 2017, the balance of deferred revenue for collaborations with Harvest start-up entities includes: Thrive Agrobiotics, Inc.; Exotech Bio, Inc.; and AD Skincare, Inc. As of December 31, 2017, the balance of deferred revenue for collaborations with Harvest start-up entities also includes: Relieve Genetics, Inc.; Genten Therapeutics, Inc.; and CRS Bio, Inc. See Note 3 for further discussion of the asset acquisition of certain Harvest entities.

6. Short-term Investments

The Company's investments are classified as available-for-sale. The following table summarizes the amortized cost, gross unrealized gains and losses, and fair value of available-for-sale investments as of September 30, 2018:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Aggregate Fair Value
U.S. government debt securities	$ 163,905	$ —	$ (96)	$ 163,809
Certificates of deposit	353	—	—	353
Total	$ 164,258	$ —	$ (96)	$ 164,162

The following table summarizes the amortized cost, gross unrealized gains and losses, and fair value of available-for-sale investments as of December 31, 2017:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Aggregate Fair Value
U.S. government debt securities	$ 6,000	$ —	$ (2)	$ 5,998
Certificates of deposit	275	—	—	275
Total	$ 6,275	$ —	$ (2)	$ 6,273

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

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As of September 30, 2018, all of the available-for-sale investments were due within one year based on their contractual maturities.

Changes in market interest rates and bond yields cause certain investments to fall below their cost basis, resulting in unrealized losses on investments. The unrealized losses of the Company's investments were primarily a result of unfavorable changes in interest rates subsequent to the initial purchase of these investments and were not significant as of September 30, 2018.

As of September 30, 2018 and December 31, 2017, the Company did not consider any of its investments to be other-than-temporarily impaired. When evaluating its investments for other-than-temporary impairment, the Company reviews factors such as the length of time and extent to which fair value has been below its cost basis, the financial condition of the issuer, the Company's ability and intent to hold the security and whether it is more likely than not that it will be required to sell the investment before recovery of its cost basis.

7. Investments in Preferred Stock

Investment in ZIOPHARM Preferred Stock

In June 2016, the Company received 100,000 shares of Series 1 Preferred Stock (the "Preferred Shares") of ZIOPHARM, with a per share stated value of $1,200, as consideration for amending their two previously existing ECC agreements. The Company received a monthly dividend, paid in additional Preferred Shares, equal to $12.00 per Preferred Share held per month divided by the stated value of the Preferred Shares. In conjunction with the license agreement with ZIOPHARM in October 2018 (Note 19), the Company returned to ZIOPHARM all of the Preferred Shares owned or accrued by the Company as of the effective date of the agreement.

The investment in ZIOPHARM preferred stock is categorized as Level 3 as there are significant unobservable inputs and the Preferred Shares are not traded on a public exchange. The fair value of the investment in ZIOPHARM preferred stock is estimated using a probability-weighted expected return ("PWERM") model. The key inputs used in the PWERM model are (i) estimating the future returns for conversion of the Preferred Shares for both product approval and a change in control of ZIOPHARM (the "conversion events") using market data of the change in value for guideline companies as a result of these conversion events; (ii) estimating the expected date and likelihood of each conversion event; and (iii) discounting these estimated future returns using a discount rate for the Preferred Shares considering industry debt issuances originated by public funds and venture capital rates of return. A significant change in unobservable inputs discussed above could result in a significant impact on the fair value of the Company's investment in ZIOPHARM preferred stock. The fair value of the Company's investment in ZIOPHARM preferred stock, including additional Preferred Shares received as dividends, was $158,122 and $160,832 as of September 30, 2018 and December 31, 2017, respectively. During the three months ended September 30, 2018 and 2017, the Company received an additional 3,847 and 3,414 Preferred Shares and recognized $4,649 and $4,311 of dividend income in the accompanying consolidated statements of operations, respectively. During the nine months ended September 30, 2018 and 2017, the Company received an additional 11,205 and 9,943 Preferred Shares and recognized $14,539 and $12,276 of dividend income in the accompanying consolidated statements of operations, respectively.

Investment in Fibrocell Preferred Stock

In March 2017, Fibrocell Science, Inc. ("Fibrocell"), one of the Company's collaborators and a related party, sold Series A Convertible Preferred Stock (the "Convertible Preferred Shares"), convertible into shares of Fibrocell common stock, and warrants to purchase shares of Fibrocell common stock to certain institutional and accredited investors, including the Company and affiliates of Third Security. The Company paid $1,161 in exchange for 1,161 Convertible Preferred Shares and warrants to acquire 99,769 shares of Fibrocell common stock. The share data reflect a 1-for-5 reverse stock split of Fibrocell's common stock effective May 25, 2018. The Convertible Preferred Shares are convertible at any time at the election of the Company and accrue dividends at 4% per annum, compounded quarterly, increasing the stated value of the shares. The investment in Fibrocell preferred stock is categorized as Level 3 as there are significant unobservable inputs and the Convertible Preferred Shares are not traded on a public exchange. The fair value of the investment in Fibrocell preferred stock is estimated using a conversion plus dividend approach utilizing the trading value of the underlying common stock and an estimated premium for the preferred stock dividend and other preferences. Market price volatility of Fibrocell's common stock and a significant change in the estimated preferred stock premium could result in a significant impact to the fair value of the investment in Fibrocell

preferred stock. As of September 30, 2018 and December 31, 2017, the fair value of the Company's investment in Fibrocell preferred stock totaled $299 and $393, respectively. See Note 17 for additional discussion of the warrants.

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Investment in Oragenics Preferred Stock

In November 2017, concurrent with Oragenics closing a preferred stock private placement, the Company exchanged a promissory note, including accrued interest, purchased from Oragenics in May 2017 and receivables due from Oragenics totaling $3,385 for Oragenics Series C preferred stock ("Series C Preferred Stock"). The Series C Preferred Stock is non-voting and non-convertible and is redeemable in whole or part at any time by Oragenics in cash. The Series C Preferred Stock accrues an annual 12% dividend payable in additional Series C Preferred Stock through May 10, 2019, and after such date, the annual dividend increases to 20%. Additionally, the Company and Oragenics amended certain future payment terms under its ECCs, as discussed in Note 5 of the Company's Annual Report. As of September 30, 2018 and December 31, 2017, based on the most recent financial information available on Oragenics, the Company concluded that there was no value to its investment in Oragenics preferred stock.

Changes in the Fair Value of Investments in Preferred Stock

The following table summarizes the changes in the Level 3 investments in preferred stock during the nine months ended September 30, 2018.

	Nine Months Ended September 30, 2018
Beginning balance	$ 161,225
Dividend income from investments in preferred stock	14,575
Net unrealized depreciation in the fair value of the investments in preferred stock	(17,379)
Ending balance	$ 158,421

8. Fair Value Measurements

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

Assets

The following table presents the placement in the fair value hierarchy of financial assets that are measured at fair value on a recurring basis, including the items for which the fair value option has been elected, at September 30, 2018:

	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	September 30, 2018
Assets				
U.S. government debt securities	$ —	$ 163,809	$ —	$ 163,809
Equity securities	3,591	1,106	—	4,697
Preferred stock	—	—	158,421	158,421
Other	—	653	—	653
Total	$ 3,591	$ 165,568	$ 158,421	$ 327,580

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The following table presents the placement in the fair value hierarchy of financial assets that are measured at fair value on a recurring basis, including the items for which the fair value option has been elected, at December 31, 2017:

	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	December 31, 2017
Assets				
U.S. government debt securities	$—	$ 5,998	$ —	$ 5,998
Equity securities	10,537	4,563	—	15,100
Preferred stock	—	—	161,225	161,225
Other	—	850	—	850
Total	$10,537	$ 11,411	$ 161,225	$ 183,173

The method used to estimate the fair value of the Level 1 assets in the tables above is based on observable market data as these equity securities are publicly-traded. The method used to estimate the fair value of the Level 2 short-term investments in the tables above is based on professional pricing sources for identical or comparable instruments, rather than direct observations of quoted prices in active markets. The method used to estimate the fair value of the Level 2 equity securities in the tables above is based on the quoted market price of the publicly-traded security, adjusted for a discount for lack of marketability. The methods used to estimate the fair value of the Level 3 assets are discussed in Note 7.

There were no transfers between levels of the fair value hierarchy during the nine months ended September 30, 2018.

Liabilities

The carrying values of the Company's long-term debt, excluding the Convertible Notes as discussed below, approximates fair value due to the length of time to maturity and/or the existence of interest rates that approximate prevailing market rates.

The calculated fair value of the Convertible Notes (Note 12) is approximately $237,000 as of September 30, 2018 and is based on the most recent third party trade of the instrument as of the balance sheet date. The fair value of the Convertible Notes are classified as Level 2 within the fair value hierarchy as there is not an active market for the Convertible Notes, however, third party trades of the instrument are considered observable inputs. The Convertible Notes are reflected at amortized cost on the accompanying consolidated balance sheet which was $145,839 as of September 30, 2018.

The Company's contingent consideration liabilities from previous acquisitions are measured on a recurring basis and were $585 at September 30, 2018 and December 31, 2017. These fair value measurements were based on significant inputs not observable in the market and thus represented a Level 3 measurement. A significant change in unobservable inputs could result in a significant impact on the fair value of the Company's contingent consideration liabilities. The contingent consideration liabilities are remeasured to fair value at each reporting date until the contingencies are resolved, and those changes in fair value are recognized in earnings. There were no changes in the fair value of the Level 3 liabilities during the nine months ended September 30, 2018.

9. Inventory

Inventory consists of the following:

	September 30, 2018	December 31, 2017
Supplies, embryos and other production materials	$ 3,368	$ 2,673
Work in process	4,578	4,767
Livestock	8,453	11,040
Feed	1,895	2,013
Total inventory	$ 18,294	$ 20,493

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10. Property, Plant and Equipment, Net

Property, plant and equipment consist of the following:

	September 30, 2018	December 31, 2017
Land and land improvements	$ 12,373	$ 11,767
Buildings and building improvements	18,533	18,183
Furniture and fixtures	1,716	2,515
Equipment	72,126	65,863
Leasehold improvements	25,281	25,277
Breeding stock	4,827	3,832
Computer hardware and software	11,490	10,128
Trees	10,635	6,642
Construction and other assets in progress	18,658	14,113
	175,639	158,320
Less: Accumulated depreciation and amortization	(52,932)	(45,646)
Property, plant and equipment, net	$ 122,707	$ 112,674

During the three and nine months ended September 30, 2018, the Company recorded losses of $85 and $5,057, respectively, on disposal of certain leasehold improvements, equipment, and other fixed assets in conjunction with the closing of one of its research and development facilities in Brazil.

Depreciation expense was $3,614 and $2,989 for the three months ended September 30, 2018 and 2017, respectively, and $10,712 and $8,623 for the nine months ended September 30, 2018 and 2017, respectively.

11. Goodwill and Intangible Assets, Net

The changes in the carrying amount of goodwill for the nine months ended September 30, 2018 are as follows:

Balance at December 31, 2017	$153,289
Foreign currency translation adjustments	(2,013)
Balance at September 30, 2018	$151,276

The Company had $13,823 of accumulated impairment losses as of September 30, 2018 and December 31, 2017.

Intangible assets consist of the following as of September 30, 2018:

	Gross Carrying Amount	Accumulated Amortization	Net
Patents, developed technologies and know-how	$257,318	$ (56,551)	$200,767
Customer relationships	10,700	(7,346)	3,354
Trademarks	6,800	(3,148)	3,652
In-process research and development	5,471	—	5,471
Total	$280,289	$ (67,045)	$213,244

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Intangible assets consist of the following as of December 31, 2017:

	Gross Carrying Amount	Accumulated Amortization	Net
Patents, developed technologies and know-how	$263,615	$ (44,954)	$218,661
Customer relationships	10,700	(6,383)	4,317
Trademarks	6,800	(2,567)	4,233
In-process research and development	5,666	—	5,666
Total	$286,781	$ (53,904)	$232,877

The balance of in-process research and development includes certain in-process research and development technology acquired
in the Company's acquisition of Oxitec in September 2015, and amortization will begin once certain regulatory approvals have
been obtained for the in-process programs.

Amortization expense was $4,689 and $5,001 for the three months ended September 30, 2018 and 2017, respectively, and $14,472 and $14,258 for the nine months ended September 30, 2018 and 2017, respectively.

12. Lines of Credit and Long-Term Debt

Lines of Credit

Trans Ova has a $5,000 revolving line of credit with First National Bank of Omaha, which matures on May 1, 2019. The line of credit bears interest at the greater of 2.95% above the London Interbank Offered Rate or 3.00%, and the actual rate was 5.06% as of September 30, 2018. As of September 30, 2018, there was no outstanding balance. The amount available under the line of credit is based on eligible accounts receivable and inventory up to the maximum principal amount. The line of credit is collateralized by certain of Trans Ova's assets and contains certain restricted covenants that include maintaining minimum tangible net worth and working capital and maximum allowable annual capital expenditures. Trans Ova was in compliance with these covenants as of September 30, 2018.

Exemplar has a $700 revolving line of credit with American State Bank, which matures on October 30, 2019. As of September 30, 2018, the line of credit bore interest at 5.25% per annum. As of September 30, 2018, there was an outstanding balance of $200.

Long-Term Debt

Long-term debt consists of the following:

	September 30, 2018	December 31, 2017
Convertible debt	$ 175,899	$ —
Notes payable	4,667	5,010
Royalty-based financing	2,147	2,132
Other	966	895
Long-term debt	183,679	8,037
Less current portion	546	502
Long-term debt, less current portion	$ 183,133	$ 7,535

Convertible Debt

Intrexon Convertible Notes

In July 2018, Intrexon completed a registered underwritten public offering of $200,000 aggregate principal amount of Convertible Notes and issued the Convertible Notes under an indenture (the "Base Indenture") between Intrexon and The Bank of New York Mellon Trust Company, N.A., as trustee, as supplemented by the First Supplemental Indenture (together with the

Base Indenture, the "Indenture"). Intrexon received net proceeds of $193,958 after deducting underwriting discounts and offering expenses of $6,042.

The Convertible Notes are senior unsecured obligations of Intrexon and bear interest at a rate of 3.50% per year, payable semiannually in arrears on January 1 and July 1 of each year beginning on January 1, 2019. The Convertible Notes mature on July 1, 2023, unless earlier repurchased or converted. The Convertible Notes are convertible into cash, shares of Intrexon's common stock or a combination of cash and shares, at Intrexon's election. The initial conversion rate of the Convertible Notes is 58.6622 shares of Intrexon common stock per $1,000 principal amount of Convertible Notes (equivalent to an initial conversion price of approximately $17.05 per share of common stock). The conversion rate is subject to adjustment upon the occurrence of certain events, but will not be adjusted for any accrued and unpaid interest. In addition, following certain corporate events that occur prior to the maturity date as defined in the Indenture, Intrexon will increase the conversion rate for a holder who elects to convert its Convertible Notes in connection with such a corporate event in certain circumstances. Prior to April 1, 2023, the holders may convert the Convertible Notes at their option only upon the satisfaction of the following circumstances:

- During any calendar quarter commencing after the calendar quarter ending on September 30, 2018, if the last reported sales price of Intrexon's common stock for at least 20 trading days (whether or not consecutive) during the last 30 consecutive trading days of the immediately preceding calendar quarter is greater than or equal to 130% of the conversion price on each applicable trading day;
- During the five business day period after any five consecutive trading day period in which the trading price, as defined in the Indenture, for the Convertible Notes is less than 98% of the product of the last reported sales price of Intrexon's common stock and the conversion rate for the Convertible Notes on each such trading day; or
- Upon the occurrence of specified corporate events as defined in the Indenture.

None of the above events allowing for conversion prior to April 1, 2023 occurred during the three months ended September 30, 2018. On or after April 1, 2023 until June 30, 2023, holders may convert their Convertible Notes at any time. Intrexon may not redeem the Notes prior to the maturity date.

If Intrexon undergoes a fundamental change, as defined in the Indenture, holders of the Convertible Notes may require Intrexon to repurchase for cash all or any portion of their Convertible Notes at a fundamental change repurchase price equal to 100% of the principal amount of the Convertible Notes to be repurchased, plus accrued and unpaid interest to, but excluding, the fundamental change repurchase date. The Indenture contains customary events of default, as defined in the agreement, and, if any of the events occur, could require repayment of a portion or all of the Convertible Notes, including accrued and unpaid interest. Additionally, the Indenture provides that Intrexon shall not consolidate with or merge with or into, or sell, convey, transfer or lease all or substantially all of its properties and assets to, another entity, unless (i) the surviving entity is organized under the laws of the United States and such entity expressly assumes all of Intrexon's obligations under the Convertible Notes and the Indenture; and (ii) immediately after such transaction, no default or event of default has occurred and is continuing under the Indenture.

The net proceeds received from the issuance of the Convertible Notes were initially allocated between long-term debt, the liability component, at $143,723 and additional paid-in capital, the equity component, at $50,235. Additional paid-in capital was further reduced by $13,367 of deferred taxes resulting from the difference between the carrying amount and the tax basis of the Convertible Notes that is created by the equity component (Note 13). As of September 30, 2018, the outstanding principal balance on the Convertible Notes was $200,000 and the carrying value of long-term debt was $145,839. The effective interest rate on the Convertible Notes, including amortization of the long-term debt discount and debt issuance costs, is 11.02%. As of September 30, 2018, the unamortized long-term debt discount and debt issuance costs totaled $54,161.

Total interest expense related to the Convertible Notes was $3,847 for the three and nine months ended September 30, 2018, which consists of $1,731 interest expense to be paid in cash and $2,116 of non-cash interest expense. Accrued cash interest of $1,731 is included in other accrued liabilities on the accompanying consolidated balance sheet as of September 30, 2018.

ActoBio Convertible Notes

In September 2018, ActoBio issued $30,000 of convertible promissory notes (the "ActoBio Notes") to a related party in conjunction with an asset acquisition with Harvest (Note 3). The ActoBio Notes have a maturity date of September

6, 2020, accrue interest at 3.0% compounded annually, are convertible into shares of ActoBio common stock at any time by the holder, and are automatically convertible in shares of ActoBio common stock upon the closing of certain financing events as defined in

the ActoBio Notes. If the ActoBio Notes have not been converted to ActoBio common stock by the maturity date, ActoBio can pay the principal and accrued interest in cash or with shares of Intrexon common stock at its election. There are no embedded features that are required to be separated from the debt host and accounted for separately, so the ActoBio Notes are recorded at $30,000. Interest expense for the three and nine months ended September 30, 2018 was $60. As of September 30, 2018, the carrying value of the ActoBio Notes, including accrued interest, was $30,060.

Notes Payable

Trans Ova has a note payable to American State Bank, which matures in April 2033 and has an outstanding principal balance of $4,581 as of September 30, 2018. Trans Ova pays monthly installments of $39, which includes interest at 3.95%. The note payable is collateralized by certain of Trans Ova's real estate and non-real estate assets.

Royalty-based Financing

AquaBounty has a royalty-based financing grant from the Atlantic Canada Opportunities Agency, a Canadian government agency, to provide funding of a research and development project. The total amount available under the award was $2,225, which AquaBounty claimed over a five year period. All amounts claimed by AquaBounty must be repaid in the form of a 10% royalty on any products commercialized out of this research and development project until fully paid. Because the timing of commercialization is subject to additional regulatory considerations, the timing of repayment is uncertain. As of the date of the acquisition by Intrexon in March 2013, AquaBounty had claimed $1,952 of the available funds and this amount was recorded at its acquisition date fair value of $1,107. The Company accretes the difference of $845 between the face value of amounts drawn and the acquisition date fair value over the expected period of repayment. Subsequent to the acquisition date, AquaBounty claimed the remaining balance available under the grant, resulting in total long-term debt of $2,147 as of September 30, 2018.

Future Maturities

Future maturities of long-term debt are as follows:

2018	$210
2019	449
2020	30,463
2021	832
2022	375
2023	200,389
Thereafter	2,974
Total	$235,692

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

13. Income Taxes

Tax provisions for interim periods are calculated using an estimate of actual taxable income or loss for the respective period, rather than estimating the Company's annual effective income tax rate, as the Company is currently unable to reliably estimate its income for the full year. For the three and nine months ended September 30, 2018, the Company had U.S. taxable loss of approximately $39,100 and $104,400, respectively, and recorded $31 of current domestic income tax benefit and $82 of current domestic income tax expense, respectively. For the three and nine months ended September 30, 2018, the Company recognized $45 and $282, respectively, of current foreign income tax benefit. For the three and nine months ended September 30, 2017, the Company had U.S. taxable income of approximately $3,930 and $23,680, respectively, and recorded $78 and $473, respectively, of current domestic income tax expense. For the three and nine months ended September 30, 2017, the Company recognized $121 and $343, respectively, of current foreign income tax benefit. For the three and nine months ended September 30, 2018, the Company recorded deferred tax benefit of $14,246 and $19,335, respectively. Of these amounts, $13,367 relates to deferred tax benefits recognized from the reversal of valuation allowances on current year domestic operating losses in the same amount as the deferred taxes recorded as a direct reduction of additional paid-in capital related to the issuance of the Convertible Notes (Note 12). The Company considered amounts recorded directly to shareholders' equity in evaluating the need

for a valuation allowance on deferred tax assets related to continuing operations. For the three and nine months ended September 30, 2017, the Company recorded deferred tax benefit of $775 and $2,294, respectively. The Company's net deferred tax assets, excluding certain deferred tax liabilities totaling $9,363, are offset by a valuation allowance due to the Company's history of net losses combined with an inability to confirm recovery of the tax benefits of the Company's losses and other net deferred tax assets. In assessing the realizability of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. Management considers the scheduled reversal of deferred tax liabilities, projected future taxable income and tax planning strategies in making this assessment.

As of September 30, 2018, the Company has loss carryforwards for U.S. federal income tax purposes of approximately $357,000 available to offset future taxable income, and federal and state research and development tax credits of approximately $7,900, prior to consideration of annual limitations that may be imposed under Section 382 of the Internal Revenue Code of 1986, as amended. These carryforwards will begin to expire in 2022. As of September 30, 2018, the Company's direct foreign subsidiaries have foreign loss carryforwards of approximately $159,700, most of which do not expire.

In 2017, the Company recorded a net provisional income tax benefit of $2,185 upon enactment of the Tax Act, which is comprised of several items. Amounts related to the remeasurement of most of the Company's domestic deferred tax assets as a result of the U.S. corporate rate change to 21% as part of the Tax Act were $87,473, which was fully offset by a reduction in the Company's valuation allowance. The Company's net U.S. deferred tax liability that is not offset by a valuation allowance was similarly written down, and the Company recorded a provisional deferred tax benefit of $1,730. The Company also recorded a provisional current tax benefit of $455, subsequently reduced to $13 in the three and nine months ended September 30, 2018, related to the expected refundability of accumulated corporate minimum tax credits. The Company has provisionally estimated its transition tax exposure to be zero, as any accumulated earnings in foreign subsidiaries are offset by accumulated deficits in other foreign subsidiaries. The provisional amounts recorded are subject to further refinement within the measurement period prescribed by SAB 118. As a result, the recorded amounts are subject to change, possibly materially, due to, among other things, changes in interpretations of the Tax Act, any legislative action to address questions that arise because of the Tax Act, any changes in accounting standards for income taxes or related interpretations in response to the Tax Act, or any updates or changes to estimates the Company utilized to provisionally compute the transition impact. No other adjustments to these provisional amounts were recorded during the nine months ended September 30, 2018.

14. Shareholders' Equity

Issuances of Common Stock

In January 2018, Intrexon closed a public offering of 6,900,000 shares of its common stock, including 1,000,000 shares of common stock purchased by affiliates of Third Security. The net proceeds of the offering were $82,374, after deducting underwriting discounts of $3,688 and offering expenses of $188, all of which were capitalized.

Share Lending Agreement

Concurrently with the offering of the Convertible Notes (Note 12), Intrexon entered into a share lending agreement (the "Share Lending Agreement") with J.P. Morgan Securities LLC (the "Share Borrower") pursuant to which Intrexon loaned and delivered 7,479,431 shares of its common stock (the "Borrowed Shares") to the Share Borrower. The Share Lending Agreement will terminate, and the Borrowed Shares will be returned to Intrexon within five business days of such termination, upon (a) termination by the Share Borrower or (b) the earliest to occur of (i) October 1, 2023 and (ii) the date, if any, on which the Share Lending Agreement is either mutually terminated or terminated by one party upon a default by the other party. The Borrowed Shares were offered and sold to the public at a price of $13.37 per share under a registered offering (the "Borrowed Shares Offering"). Intrexon did not receive any proceeds from the sale of the Borrowed Shares to the public. The Share Borrower or its affiliates received all the proceeds from the sale of the Borrowed Shares to the public. Affiliates of Third Security purchased all of the shares of common stock in the Borrowed Shares Offering.

The Share Lending Agreement was entered into at fair value and met the requirements for equity classification. Therefore, the value is netted against the issuance of the Borrowed Shares in additional paid-in capital. Additionally,

the Borrowed Shares are not included in the denominator for loss per share attributable to Intrexon shareholders unless the Share Borrower defaults on the Share Lending Agreement.

Components of Accumulated Other Comprehensive Loss

The components of accumulated other comprehensive loss are as follows:

	September 30, 2018	December 31, 2017
Unrealized loss on investments	$ (96)	$ (2)
Loss on foreign currency translation adjustments	(22,804)	(15,552)
Total accumulated other comprehensive loss	$ (22,900)	$ (15,554)

15. Share-Based Payments

The Company records the fair value of stock options and restricted stock units ("RSUs") issued to employees and nonemployees as of the grant date as stock-based compensation expense. Stock-based compensation expense for employees and nonemployees is recognized over the requisite service period, which is typically the vesting period.

Stock-based compensation costs included in the consolidated statements of operations are presented below:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Cost of products	$14	$30	$64	$86
Cost of services	51	82	207	242
Research and development	1,681	2,383	7,315	7,018
Selling, general and administrative	6,386	9,562	20,754	24,603
Total	$8,132	$12,057	$28,340	$31,949

Intrexon Stock Option Plans

In April 2008, Intrexon adopted the 2008 Equity Incentive Plan (the "2008 Plan") for employees and nonemployees pursuant to which Intrexon's board of directors granted share based awards, including stock options, to officers, key employees and nonemployees. Upon the effectiveness of the 2013 Omnibus Incentive Plan (the "2013 Plan"), no new awards may be granted under the 2008 Plan. As of September 30, 2018, there were 414,754 stock options outstanding under the 2008 Plan.

Intrexon adopted the 2013 Plan for employees and nonemployees pursuant to which Intrexon's board of directors may grant share based awards, including stock options and shares of common stock, to employees, officers, consultants, advisors, and nonemployee directors. The 2013 Plan became effective upon the closing of the Company's initial public offering in August 2013, and as of September 30, 2018, there were 20,000,000 shares authorized for issuance under the 2013 Plan, of which 10,745,770 stock options and 980,758 RSUs were outstanding and 5,310,530 shares were available for grant.

Stock option activity was as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)
Balances at December 31, 2017	11,382,747	$ 28.99	7.32
Granted	1,174,839	15.04	
Exercised	(41,314)	(6.33)	
Forfeited	(808,086)	(21.41)	
Expired	(547,662)	(27.40)	
Balances at September 30, 2018	11,160,524	28.23	6.79
Exercisable at September 30, 2018	7,177,315	30.15	6.02

During the nine months ended September 30, 2018, Intrexon granted 1,069,126 RSUs with a weighted average grant date fair value of $13.84 per share, of which 25,000 have vested and 980,758 remain outstanding and unvested as of September 30, 2018.

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

In October 2015, the compensation committee and the independent members of Intrexon's board of directors approved a compensation arrangement whereby the Company's Chief Executive Officer ("CEO") would receive a monthly salary. Previously, the CEO did not receive compensation for his services as an employee of the Company other than through his participation in the Company's Annual Executive Incentive Plan, which became effective January 1, 2015. Pursuant to the compensation agreement, the CEO receives a base salary of $200 per month payable in fully vested shares of Intrexon common stock with such shares subject to a three-year lock-up on resale. The monthly number of shares of common stock is calculated based on the closing price on the last trading day of each month and the shares are issued pursuant to the terms of a Restricted Stock Unit Agreement ("RSU Agreement") that was executed between Intrexon and the CEO pursuant to the terms of the 2013 Plan. The RSU Agreement became effective in November 2015, and had an initial term of twelve months. The independent members of Intrexon's board of directors, with the recommendation of the compensation committee of the board of directors, subsequently approved extensions of the RSU Agreement through March 31, 2019, all of which are on the same terms as the original RSU Agreement. The fair value of the shares issued as compensation for services is included in selling, general and administrative expenses in the Company's consolidated statements of operations and totaled $499 and $480 for the three months ended September 30, 2018 and 2017, respectively, and $1,468 and $1,428 for the nine months ended September 30, 2018 and 2017, respectively.

AquaBounty Stock Option Plans

In March 2016, AquaBounty's board of directors adopted the AquaBounty 2016 Equity Incentive Plan ("AquaBounty 2016 Plan") to replace the AquaBounty 2006 Equity Incentive Plan ("AquaBounty 2006 Plan"). The AquaBounty 2016 Plan provides for the issuance of incentive stock options, non-qualified stock options and awards of restricted and direct stock purchases to directors, officers, employees, and consultants of AquaBounty. The AquaBounty 2016 Plan was approved by AquaBounty's shareholders at its annual meeting in April 2016. Upon the effectiveness of the AquaBounty 2016 Plan, no new awards may be granted under the AquaBounty 2006 Plan.

As of September 30, 2018, there were 339,964 options outstanding under both AquaBounty plans, of which 271,467 were exercisable, at a weighted average exercise price of $7.09 per share.

16. Commitments and Contingencies

Operating Leases

The Company leases certain facilities and equipment under noncancelable operating leases. The equipment leases are renewable at the option of the Company. At September 30, 2018, future minimum lease payments under operating leases having initial or remaining noncancelable lease terms in excess of one year are as follows:

2018	$1,508
2019	9,417
2020	9,577
2021	8,904
2022	8,072
2023	7,009
Thereafter	31,330
Total	$75,817

Rent expense, including other facility expenses, was $3,286 and $3,165 for the three months ended September 30, 2018 and 2017, respectively, and $9,874 and $7,772 for the nine months ended September 30, 2018 and 2017, respectively.

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Purchase Commitments

As of September 30, 2018, the Company had outstanding contractual purchase commitments of $8,826, which primarily relate to amounts that will be paid in 2018, 2019, and 2020 upon delivery of commercial non-browning apple trees.

Contingencies

In March 2012, Trans Ova was named as a defendant in a licensing and patent infringement suit brought by XY, LLC ("XY") alleging that certain of Trans Ova's activities breached a 2004 licensing agreement and infringed on patents that XY allegedly owned. Trans Ova filed a number of counterclaims in the case. In Colorado District Court, the matter proceeded to a jury trial in January 2016. The jury determined that XY and Trans Ova had each breached the licensing agreement and that Trans Ova had infringed XY's patents. In April 2016, the court issued its post-trial order, awarding $528 in damages to Trans Ova and $6,066 in damages to XY. The order also provided Trans Ova with a compulsory license to XY's technology, subject to an ongoing royalty obligation. Both parties appealed the district court's order, which appeal was decided in May 2018 by the Court of Appeals for the Federal Circuit. The Court denied Trans Ova's appeal of its claims for antitrust, breach of contract and patent invalidity (except as to one patent, for which the Court affirmed invalidity in a separate, same-day ruling in a third-party case). The Court considered the issue of willfulness to be moot since the district court did not award damages for the willfulness finding. Finally, the Court remanded the district court's calculation of the ongoing royalty and instructed the district court to re-calculate the ongoing royalty in light of post-verdict economic factors.

Since the inception of the 2004 agreement, Trans Ova has remitted payments to XY pursuant to the terms of that agreement, or pursuant to the terms of the April 2016 court order, and has recorded these payments in cost of services in the consolidated statements of operations for the respective periods. For the period from inception of the 2004 agreement through the court's April 2016 order, aggregate royalty and license payments were $3,170, of which $2,759 had not yet been deposited by XY. In 2016, the Company recorded expense of $4,228 representing the excess of the net damages awarded to XY, including prejudgment interest, over the liability previously recorded by Trans Ova for uncashed checks previously remitted to XY. In August 2016, Trans Ova deposited the net damages amount, including prejudgment interest, into the court's treasury, to be held until the appeals process is complete and final judgment amounts are determined. As of September 30, 2018, this amount is included in restricted cash on the accompanying consolidated balance sheet. In December 2016, Trans Ova elected to void the outstanding checks discussed above, and these amounts have been reclassified to other accrued liabilities on the accompanying consolidated balance sheets as of September 30, 2018 and December 31, 2017.

In December 2016, XY filed a complaint for patent infringement and trade secret misappropriation against Trans Ova in the District Court of Waco, Texas. Since the claims in this 2016 complaint directly relate to the 2012 licensing dispute and patent issues, Trans Ova filed and was granted a motion for change of venue to Colorado District Court. Trans Ova also filed a motion to dismiss, from which the Court recently dismissed nine of the twelve counts of the complaint. Presently, three counts for patent infringement remain pending. Trans Ova and the Company could elect to enter into a settlement agreement in order to avoid the further costs and uncertainties of litigation.

In January 2017, the Division of Enforcement of the SEC informed the Company of an investigation that the Company believes concerned certain issues raised by a previously disclosed consolidated putative shareholder class action lawsuit that was dismissed on November 1, 2017, and a previously disclosed shareholder derivative action that was dismissed on January 25, 2018. In September 2018, the Division of Enforcement informed the Company that it had concluded its investigation of these matters and that the Division of Enforcement does not intend to recommend enforcement action against the Company based on the investigation.

The Company may become subject to other claims, assessments and governmental investigations from time to time in the ordinary course of business. Such matters are subject to many uncertainties and outcomes are not predictable with assurance. The Company accrues liabilities for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. As of September 30, 2018 and December 31, 2017, the Company does not believe that any such matters, individually or in the aggregate, will have a material adverse effect on the Company's business, financial condition, results of operations, or cash flows.

17. Related Party Transactions

Third Security and Affiliates

The Company's CEO and Chairman of the board of directors is also the Senior Managing Director and CEO of Third Security and owns 100% of the equity interests of Third Security. In November 2015, the independent members of Intrexon's board of directors, with the recommendation of the audit committee of the board of directors, approved the execution of a Services

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Agreement ("Services Agreement") with Third Security pursuant to which Third Security provides the Company with certain professional, legal, financial, administrative, and other support services necessary to support the Company and its CEO. As consideration for providing these services, Third Security is entitled to a fee of $800 per month to be paid in the form of fully-vested shares of the Company's common stock. The number of shares of common stock is calculated based on the closing price of the Company's common stock on the 15th day of each month. The payments made by the Company under the Services Agreement constitute, in the aggregate, an award under the 2013 Plan and are subject to the terms of the 2013 Plan (Note 15). The Services Agreement had a term of one year, can be terminated by the Company at any time, and may be extended only by agreement of the parties, including approval of a majority of the independent members of Intrexon's board of directors. The independent members of Intrexon's board of directors, with the recommendation of the audit committee of the board of directors, subsequently approved extensions of the Services Agreement through January 1, 2019. For the three months ended September 30, 2018 and 2017, the Company issued 166,143 shares and 118,828 shares, respectively, with values of $2,417 and $2,251, respectively, to Third Security as payment for services pursuant to the Services Agreement. For the nine months ended September 30, 2018 and 2017, the Company issued 466,460 shares and 329,649 shares, respectively, with values of $6,522 and $6,506, respectively, to Third Security as payment for services pursuant to the Services Agreement. In addition to the foregoing Services Agreement, the Company reimburses Third Security for certain out-of-pocket expenses incurred on the Company's behalf, and the total expenses incurred by the Company under this arrangement were $16 and $4 for the three months ended September 30, 2018 and 2017, respectively, and $33 and $428 for the nine months ended September 30, 2018 and 2017, respectively.

See also Note 15 regarding compensation arrangements between the Company and its CEO.

In October 2017, the Company entered into a Preferred Stock Equity Facility ("Preferred Stock Facility") with an affiliate of Third Security ("Third Security Affiliate"). Under the Preferred Stock Facility, the Company could, from time to time at its sole and exclusive option, issue and sell to the Third Security Affiliate, up to $100,000 of newly issued Series A Redeemable Preferred Stock ("Series A Preferred Stock"). In conjunction with the Company's July 2018 registered underwritten public offering of Convertible Notes (Note 14), the Preferred Stock Facility was terminated. No shares of Series A Preferred Stock had been issued under the Preferred Stock Facility.

The Company also subleases certain administrative offices to Third Security. The significant terms of the lease mirror the terms of the Company's lease with the landlord, and the Company recorded sublease income of $22 and $10 for the three months ended September 30, 2018 and 2017, respectively, and $66 and $32 for the nine months ended September 30, 2018 and 2017, respectively.

Transactions with ECC Parties

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

The Company holds a promissory note convertible into shares of Fibrocell common stock ("convertible note") and warrants to purchase shares of Fibrocell common stock. As of September 30, 2018 and December 31, 2017, the value of the convertible note and warrants totaled $300 and $575, respectively, and is included in other assets on the accompanying consolidated balance sheets. See Note 7 for additional discussion of the Company's investments in Fibrocell.

Other Related Parties

In June 2015, the Company entered into an agreement with Harvest, an investment fund sponsored by Harvest Capital Strategies, LLC, and a related party based on ownership in the fund by affiliates of Third Security. Harvest was established to invest in life science research and development start-up opportunities that the Company offered to Harvest with exclusive rights of first-look and first negotiation. Based on this agreement, Harvest established six new collaboration entities, each of which entered into an ECC with the Company in a designated field. The terms of such ECCs were negotiated between the Company and Harvest. As consideration for providing exclusive rights of first-look and first negotiation for start-up opportunities, the Company received a portion of the management fee collected by the fund sponsor of Harvest. These fees are included in other income in the accompanying consolidated statements of operations and totaled $613 and $1,839 for the three and nine months ended September 30, 2017,

respectively. In September 2017, the commitment period for Harvest was terminated and, as a result, the agreement with Harvest terminated. The termination of the agreement had no effect on the existing collaborations with Harvest-controlled entities. See Note 3 for further discussion of the asset acquisition of certain Harvest entities.

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18. Net Loss per Share

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

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Historical net loss per share:				
Numerator:				
Net loss attributable to Intrexon	$(57,324)	$ (39,689)	$(168,871)	$ (89,752)
Denominator:				
Weighted average shares outstanding, basic and diluted	129,518,989	120,518,885	128,843,991	119,741,291
Net loss attributable to Intrexon per share, basic and diluted	$(0.44)	$ (0.33)	$(1.31)	$ (0.75)

The following potentially dilutive securities as of September 30, 2018 and 2017, have been excluded from the above computations of diluted weighted average shares outstanding for the three and nine months then ended as they would have been anti-dilutive:

	September 30,	
	2018	2017
Convertible debt	13,507,746	—
Options	11,160,524	12,641,770
Restricted stock units	980,758	—
Warrants	133,264	133,264
Total	25,782,292	12,775,034

19. Subsequent Events

In October 2018, the Company, through its wholly owned subsidiary Precigen, entered into a license agreement (the "License Agreement") with ZIOPHARM, which terminated and replaced the terms of the original ZIOPHARM ECC, including amendments. Pursuant to the terms of the License Agreement, the Company granted ZIOPHARM an exclusive, worldwide, royalty-bearing, sub-licensable license to research, develop and commercialize (i) products utilizing the Company's RheoSwitch gene switch ("RTS") to express IL-12 (the "IL-12 Products") for the treatment of cancer, (ii) chimeric antigen receptor ("CAR") products directed to (a) CD19 for the treatment of cancer (the "CD19 Products"), and (b) a second target, subject to the rights of Ares Trading S.A. ("Ares Trading") to pursue such target under the License and Collaboration Agreement entered into between the Company and Ares Trading (the "Merck Agreement"), and (iii) T-cell receptor ("TCR") products (the "TCR Products") designed for neoantigens for the treatment of cancer or the treatment and prevention of human papilloma virus ("HPV") to the extent that the primary reason for such treatment or prevention is to prevent cancer, which is referred to as the HPV Field. The Company has also granted ZIOPHARM an exclusive, worldwide, royalty-bearing, sub-licensable license for certain patents relating to the Company's Sleeping Beauty technology to research, develop and commercialize TCR Products for both neoantigens and shared antigens for the treatment of cancer and in the HPV Field. ZIOPHARM will be solely responsible for all aspects of the research, development and commercialization of the exclusively licensed products for the treatment of cancer. ZIOPHARM is required to use commercially reasonable efforts to develop and commercialize IL-12 Products and CD19 Products, and after a two-year period, the TCR Products. The Company also granted ZIOPHARM an exclusive, worldwide, royalty-bearing, sub-licensable license to research, develop and commercialize products utilizing an additional construct that expresses RTS IL-12 (the "Gorilla IL-12 Products") for the treatment of cancer and in the HPV Field. ZIOPHARM is responsible for all development costs associated with each of the licensed products, other than Gorilla IL-12 Products. ZIOPHARM and the Company will share the development costs and operating profits for Gorilla IL-12 Products, with ZIOPHARM responsible for 80% of the development costs and receiving 80% of the operating profits, and the Company responsible for the remaining 20% of the development costs and receiving 20% of the operating profits, except that ZIOPHARM will bear all development costs and the Company will share equally in operating profits for Gorilla IL-12 Products in the HPV Field.

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In consideration of the licenses and other rights granted by the Company, ZIOPHARM will pay the Company an annual license fee of $100 and has agreed to reimburse the Company up to $1,000, payable in four quarterly installments, with respect to historical Gorilla IL-12 Products. ZIOPHARM will make milestone payments, payable upon the initiation of later stage clinical trials and upon the approval of exclusively licensed products in various jurisdictions, totaling up to an additional $52,500 for each of four exclusively licensed products, up to an aggregate of $210,000. In addition, ZIOPHARM will pay the Company tiered royalties ranging from low-single digits to high-single digits on the net sales derived from the sales of any approved IL-12 Products and CAR products. ZIOPHARM will also pay the Company royalties ranging from low-single digits to mid-single digits on the net sales derived from the sales of any approved TCR Products, up to maximum royalty amount of $100,000 in the aggregate. ZIOPHARM will also pay the Company 20% of any sublicensing income received by ZIOPHARM relating to the licensed products.

The Company will retain rights to research, develop and commercialize CAR products for all other targets, subject to the rights of Ares Trading to pursue such target under the Merck Agreement. In addition, the Company may research, develop and commercialize products for the treatment of cancer, outside of the products exclusively licensed to ZIOPHARM. The Company will pay ZIOPHARM royalties ranging from low-single digits to mid-single digits on the net sales derived from the sale of the Company's CAR products, up to $100,000. The Company will also be entitled to receive from ZIOPHARM reimbursement of costs incurred to transition the necessary knowledge and materials for ZIOPHARM programs for a period of up to one year from the effective date.

The Company has agreed that, during the term of the License Agreement, it will not use the licensed intellectual property to research, develop or commercialize any exclusive product for the treatment of cancer. In addition, for a three year period following the effective date of the License Agreement, the Company will not research or develop products utilizing regulatable switches that control expression of IL-12 or TCR products designed for neoantigens, in each case for the treatment or prevention of cancer. The Company has agreed to amend the research and development agreement between the Company, ZIOPHARM, and the University of Texas MD Anderson Cancer Center or otherwise make arrangements in order to ensure that all of its benefits and rights therewith vest in ZIOPHARM from the Effective Date of the License Agreement. As between the parties, the Company has agreed to perform all of the obligations of ZIOPHARM under the Merck Agreement, other than an obligation of exclusivity thereunder and ZIOPHARM will remain responsible for all payments owed to Ares Trading with respect to CD19 and the other target under the Merck Agreement as a result of ZIOPHARM's, its affiliates' or its sublicensees' exploitation of CAR products. Further, the Company is entitled to receive all rights and financial considerations with respect to all other CAR products, subject to the CAR royalties due to ZIOPHARM for such products. The License Agreement will terminate on a product-by-product and/or country-by-country basis upon the expiration of the later to occur of (i) the expiration of the last to expire patent claim for a licensed product, or (ii) 12 years after the first commercial sale of a licensed product in such country. In addition, ZIOPHARM may terminate the License Agreement on a country-by-country or program-by-program basis following written notice to the Company, and either party may terminate the License Agreement following notice of a material breach.

Pursuant to the License Agreement, the 2016 Securities Issuance Agreement between the Company and ZIOPHARM was terminated as of the effective date of the License Agreement, all of the benefits, rights, obligations and liabilities thereunder immediately ceased and terminated and the Company returned to ZIOPHARM all of the Preferred Shares owned by the Company as of the Effective Date. The Company's investment in ZIOPHARM preferred stock was valued at $158,122 as of September 30, 2018.

The Company will record the effects of the transaction during the fourth quarter of 2018. The Company is still evaluating the accounting impact but anticipates an impact to earnings resulting from the difference between the fair value of the Preferred Shares returned to ZIOPHARM and the reduction in deferred revenue expected to arise from the curtailment of the Company's obligation to perform services for ZIOPHARM.

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Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following "Management's Discussion and Analysis of Financial Condition and Results of Operations" should be read in conjunction with the unaudited financial information and the notes thereto included in this Quarterly Report on Form 10-Q, or Quarterly Report, and our Annual Report on Form 10-K for the year ended December 31, 2017, or Annual Report.

The following discussion contains forward-looking statements that reflect our plans, estimates and beliefs. Our actual results could differ materially from those discussed in the forward-looking statements and you are cautioned not to place undue reliance on forward-looking statements. Factors that could cause or contribute to these differences include those discussed below and elsewhere in this Quarterly Report, particularly in "Special Note Regarding Forward-Looking Statements" and "Risk Factors." The forward-looking statements included in this Quarterly Report are made only as of the date hereof.

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.

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.

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This ECC strategy 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 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. For example, in October 2018, through our wholly owned subsidiary, Precigen Therapeutics, Inc., or Precigen, we entered into a license agreement, or the License Agreement, with ZIOPHARM Oncology, Inc., or ZIOPHARM, which terminated and replaced the terms of the original ECC, including amendments, with ZIOPHARM. The License Agreement gives us development and commercialization control over certain products previously licensed to ZIOPHARM. See "Notes to the Consolidated Financial Statements (Unaudited) - Note 19" appearing elsewhere in this Quarterly Report.

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. For a discussion of our JVs, see the "Notes to the Consolidated Financial Statements (Unaudited) - Note 4" appearing elsewhere in this Quarterly Report. Additionally, 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.

Our operating subsidiaries

To derive value from the broad potential applications of our synthetic biology technologies, and consistent with the evolution of our business strategy, we routinely consider ways to organize our business to facilitate strategic opportunities. For example, effective January 1, 2018, we transferred substantially all of our gene and cell therapy assets for human health under a newly-formed wholly owned subsidiary, Precigen, and we consolidated therapeutic applications of our proprietary ActoBiotics platform under ActoBio Therapeutics, Inc., or ActoBio. In addition, we have acquired a number of ventures that are already enabling products that benefit from the application of synthetic biology and that we now operate as subsidiaries. Our strategy contemplates the continued formation and acquisition of such operating subsidiaries. As these enterprises develop, we will determine whether to maintain full ownership, introduce investors via either private or public financing, or seek strategic options to partner or divest the businesses.

Primary wholly owned operating subsidiaries

Precigen, Inc.

Precigen is a fully-integrated gene and cell therapy company committed to delivering precision medicines through innovation that puts patients first. Utilizing platform technologies owned by Precigen or licensed from Intrexon

Corporation, or Intrexon, for programming and engineering genetic code, Precigen is developing and investigating next-generation therapeutics to enable patient-focused, cost-effective treatments to address unmet medical needs in the areas of oncology, autoimmune disorders, and emerging specialty therapy areas. Precigen is designing investigational therapies intended to be controllable and targeted, with a broad pipeline of internal and partnered programs, all of which are at the preclinical or clinical stages.

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ActoBio Therapeutics, Inc.
ActoBio is pioneering a new class of microbe-based ActoBiotics biopharmaceuticals that enable expression and local delivery of disease-modifying therapeutics. The ActoBiotics platform produces biologics through oral or topical administration with treatment applications across many diseases including oral, gastrointestinal, and autoimmune/allergic disorders. We believe this cost-effective approach to development will provide safer and more efficacious treatments than injectable biologics. ActoBio, which is party to a number of our ECC agreements, has a strong research and development pipeline with the latest stage candidate in Phase 2b clinical trials and an extensive portfolio of candidates ready for clinical development across a number of potential indications.
Trans Ova Genetics, L.C.
Trans Ova Genetics, L.C., or Trans Ova, is internationally recognized as a provider of industry-leading bovine reproductive technologies. Intrexon and Trans Ova are building upon Trans Ova's original platform with a goal of achieving higher levels of delivered value to dairy and beef cattle producers. Progentus, L.C., or Progentus, a wholly owned subsidiary of Trans Ova, is a provider of bovine embryos. ViaGen, L.C., or ViaGen, a wholly owned subsidiary of Trans Ova, is a provider of cloning technology for livestock species. Exemplar Genetics, LLC, or Exemplar, a wholly owned subsidiary through the combined ownership of Trans Ova, ViaGen and us, is committed to enabling the study of life-threatening human diseases through the development of miniswine research models and services, as well as enabling the production of cells and organs in its genetically engineered swine, for human therapeutic use.
Okanagan Specialty Fruits, Inc.
Okanagan Specialty Fruits, Inc. and its affiliates, or Okanagan, is the pioneering agricultural company behind the world's first non-browning apple without the use of any artificial additives. Okanagan is scaling up its commercial supplies of non-browning apples and developing new commercial tree fruit varieties intended to provide benefits to the entire supply chain, from growers to consumers.
Oxitec Limited
Oxitec Limited, or Oxitec, is a pioneering company in biological insect control solutions. Oxitec is developing products that use genetic engineering to control insect pests that spread disease and damage crops. Among the applications of its platform, which uses advanced genetics and molecular biology, Oxitec has developed innovative solutions for controlling Aedes aegypti, a mosquito that is a known vector for the transmission of infectious disease including dengue fever, chikungunya, and Zika. Oxitec is pursuing regulatory and commercial approvals for its insect solutions in a number of countries, including the United States, Brazil, and the Cayman Islands.
Primary majority-owned operating subsidiary
AquaBounty Technologies, Inc.
AquaBounty Technologies, Inc., or AquaBounty, of which we owned approximately 58 percent as of December 31, 2017, is focusing on improving productivity in commercial aquaculture, including the development of the AquAdvantage Salmon, an Atlantic salmon that has been genetically enhanced to reach market size in less time than conventionally farmed Atlantic salmon and approved by the Food and Drug Administration. In January 2018, AquaBounty raised $12.0 million through an underwritten public offering, in which we participated by investing $5 million. As a result of this transaction and subsequent exercises of associated warrants, our ownership has decreased to approximately 52 percent as of September 30, 2018. In the future, our ownership stake in AquaBounty may drop below 50 percent, which may result in our deconsolidating AquaBounty.
Mergers, acquisitions, and technology in-licensing
We may augment our suite of proprietary technologies through mergers or acquisitions of technologies, which would then become available to new or existing ventures, including operating subsidiaries, JVs, and collaborations. Among other things, we may 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. See "Notes to the Consolidated Financial Statements (Unaudited) - Note 3" appearing elsewhere in this Quarterly Report for further discussion of mergers, acquisitions or significant technology in-licensing activities in 2018.

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Financial overview

We have incurred significant losses since our inception. We anticipate that we may continue to incur significant losses for the foreseeable future, and we may never achieve or maintain profitability. Outside of collaboration and license fee payments and sales of products and services, which vary over time, we have not generated significant revenues, including revenues or royalties from product sales by us or our collaborators. Certain of our consolidated subsidiaries require regulatory approval and/or commercial scale-up before they may commence significant product sales and operating profits.

We expect our future capital requirements will be substantial, particularly as we continue to develop our business and expand our synthetic biology technology platform. In January 2018, we closed a public offering of 6,900,000 shares of our common stock, including 1,000,000 shares of common stock purchased by affiliates of Third Security, LLC, or Third Security, the net proceeds of which were $82.4 million, after deducting underwriting discounts and commissions and offering expenses paid by us. Additionally, in July 2018, we closed a public offering of $200 million aggregate principal amount of 3.50 percent convertible senior notes due 2023, or the Convertible Notes. We believe that our existing cash and cash equivalents, short-term investments, and cash expected to be received from our current collaborators and for sales of products and services provided by our consolidated subsidiaries will enable us to fund our operating expenses and capital expenditure requirements for at least the next 12 months. In conjunction with the closing of the Convertible Notes, the Preferred Stock Equity Facility, or Preferred Stock Facility, with an affiliate of Third Security, pursuant to which we had an option to issue up to $100 million of Series A Redeemable Preferred Stock, or Series A Preferred Stock, was terminated. No shares of Series A Preferred Stock were issued under the Preferred Stock Facility.

Sources of revenue

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

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

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

We generate product and service revenues primarily through sales of products or services that are created from technologies developed or owned by us. Our primary current offerings include sales of advanced reproductive technologies, including our bovine embryo transfer and in vitro fertilization processes and from genetic preservation and sexed semen processes and applications of such processes to other livestock, as well as sales of livestock and embryos produced using these processes and used in production. We recognize revenue when the customer takes ownership of the promised product or when the promised service is completed.

In future periods, our revenues will depend in part on our ability to partner our more mature programs and capabilities, the number of collaborations to which we are party, the advancement and creation of programs within our collaborations and the extent to which our collaborators bring products enabled by our technologies to market. For example, as a result of the execution of the License Agreement with ZIOPHARM in October 2018, we expect our future revenues to decrease due to the expected curtailment of our obligation to perform research and development services for ZIOPHARM. Our revenues will also depend upon our ability to maintain or improve the volume and pricing of our current product and service offerings and to develop and scale up production of new offerings from the

various technologies of our subsidiaries. Our future revenues may also include additional revenue streams we may acquire through mergers and acquisitions. In light of our limited operating history and experience, there can be no assurance as to the timing, magnitude and predictability of revenues to which we might be entitled.

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Cost of products and services

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

Research and development expenses

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

- salaries and benefits, including stock-based compensation expense, for personnel in research and development functions;
- fees paid to consultants and contract research organizations who perform research on our behalf and under our direction;
- costs related to laboratory supplies used in our research and development efforts;
- costs related to certain in-licensed technology rights or reacquired in-process research and development;
- depreciation of leasehold improvements and laboratory equipment;
- amortization of patents and related technologies acquired in mergers and acquisitions; and
- rent and utility costs for our research and development facilities.

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

The table below summarizes our research and development expenses incurred to expand or otherwise improve our multiple platform technologies, the costs incurred to develop a specific application of our technologies in support of current or prospective partners, or costs incurred to expand or otherwise improve our products and services for the three and nine months ended September 30, 2018 and 2017. Other research and development expenses for these periods include indirect salaries and overhead expenses that are not allocated to either expanding or improving our multiple platform technologies, specific applications of our technologies in support of current or prospective partners, or expanding or improving our product and services offerings. Additionally, other research and development expenses for the three and nine months ended September 30, 2018 include an $8.7 million expense related to in-process research and development reacquired as part of an asset acquisition in September 2018, which was immediately expensed. Other research and development expenses for the nine months ended September 30, 2018 also include approximately $5.3 million of one-time costs associated with closing one of Oxitec's Brazilian subsidiary's leased research and development facilities as we decentralized operations previously conducted in this facility.

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	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
	(In thousands)			
Expansion or improvement of our platform technologies	$5,056	$3,652	$13,565	$10,476
Specific applications of our technologies in support of current and prospective partners	18,676	19,363	55,440	56,369
Expansion or improvement of our product and service offerings	6,027	6,917	21,729	20,030
Other	15,126	6,540	33,338	17,788
Total research and development expenses	$44,885	$36,472	$124,072	$104,663

We expect that our research and development expenses will increase as we enter into new collaborations, develop our own proprietary programs, expand our offerings, and reacquire previously licensed rights for our own development. We believe these increases will likely include increased costs related to the hiring of additional personnel in research and development functions, increased costs paid to consultants and contract research organizations and increased costs related to laboratory supplies. Research and development expenses may also increase as a result of ongoing research and development operations that we might assume through mergers and acquisitions.

Selling, general and administrative expenses

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

SG&A expenses may increase in the future to support our expanding operations as we explore new partnering opportunities and continue to develop our proprietary programs. These increases would likely include costs related to the hiring of additional personnel and increased fees for business development functions, costs associated with defending us in litigation matters, the costs of outside consultants and other professional services. SG&A expenses may also increase as a result of ongoing operations that we might assume through mergers and acquisitions.

Other income (expense), net

We hold equity securities and preferred stock received and/or purchased from certain collaborators. Other than investments accounted for using the equity method discussed below, we elected the fair value option to account for our equity securities and preferred stock held in these collaborators. These equity securities and preferred stock are recorded at fair value at each reporting date. Unrealized appreciation (depreciation) resulting from fair value adjustments are reported as other income (expense) in the consolidated statements of operations. As such, we bear the risk that fluctuations in the securities' share prices may significantly impact our results of operations. In conjunction with the License Agreement in October 2018, all of our ZIOPHARM preferred shares were retired.

Interest expense is expected to increase in future periods as we incur interest expense related to the Convertible Notes issued in July 2018.

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

Dividend income consists of the monthly preferred stock dividends received from our investments in preferred stock. Dividend income is expected to decrease in future periods as a result of the retirement of our ZIOPHARM preferred shares.

In September 2017, the commitment period for Harvest Intrexon Enterprise Fund I, LP, or Harvest, was terminated and, as a result, the agreement with Harvest terminated. The termination of the agreement had no effect on the existing collaborations with Harvest-controlled entities. Through September 2017, as consideration for providing exclusive rights of first-look and first negotiation, we received a portion of the management fee collected by the fund sponsor of Harvest for our obligation to provide Harvest with investment proposals that were suitable for pursuit by a start-up. These fees are included in other income.

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Equity in net income (loss) of affiliates

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

Results of operations

Comparison of the three months ended September 30, 2018 and the three months ended September 30, 2017

The following table summarizes our results of operations for the three months ended September 30, 2018 and 2017, together with the changes in those items in dollars and as a percentage:

	Three Months Ended September 30,		Dollar Change	Percent Change
	2018	2017		
	(In thousands)			
Revenues (1)				
Collaboration and licensing revenues (2)	$14,324	$28,155	$(13,831)	(49.1)%
Product revenues	6,829	7,670	(841)	(11.0)%
Service revenues	10,414	9,975	439	4.4 %
Other revenues	881	216	665	>200%
Total revenues	32,448	46,016	(13,568)	(29.5)%
Operating expenses				
Cost of products	8,877	8,001	876	10.9 %
Cost of services	6,449	7,013	(564)	(8.0)%
Research and development	44,885	36,472	8,413	23.1 %
Selling, general and administrative	38,708	39,277	(569)	(1.4)%
Total operating expenses	98,919	90,763	8,156	9.0 %
Operating loss	(66,471)	(44,747)	(21,724)	48.5 %
Total other income (expense), net	(3,727)	6,086	(9,813)	(161.2)%
Equity in loss of affiliates	(2,870)	(2,993)	123	(4.1)%
Loss before income taxes	(73,068)	(41,654)	(31,414)	75.4 %
Income tax benefit	14,322	818	13,504	>200%
Net loss	(58,746)	(40,836)	(17,910)	43.9 %
Net loss attributable to noncontrolling interests	1,422	1,147	275	24.0 %
Net loss attributable to Intrexon	$(57,324)	$(39,689)	$(17,635)	44.4 %

(1) Revenues in 2018 are accounted for under Accounting Standards Codification, or ASC, 606, Revenue from Contracts with Customers, or ASC 606, and revenues in 2017 are accounted for under ASC 605, Revenue Recognition, or ASC 605. We adopted ASC 606 on January 1, 2018 using the modified retrospective method, which applies the changes in accounting prospectively and does not restate prior periods.

(2) Including $11,952 and $24,492 from related parties for the three months ended September 30, 2018 and 2017, respectively.

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Collaboration and licensing revenues

The following table shows the collaboration and licensing revenues recognized for the three months ended September 30, 2018 and 2017, together with the changes in those items.

	Three Months Ended September 30,		Dollar Change
	2018	2017	
	(In thousands)		
ZIOPHARM Oncology, Inc.	$4,826	$10,373	$(5,547)
Oragenics, Inc.	705	475	230
Fibrocell Science, Inc.	391	1,683	(1,292)
Genopaver, LLC	689	1,422	(733)
S & I Ophthalmic, LLC	—	376	(376)
OvaXon, LLC	—	262	(262)
Intrexon Energy Partners, LLC	1,329	1,903	(574)
Persea Bio, LLC	199	266	(67)
Ares Trading S.A.	1,576	2,356	(780)
Intrexon Energy Partners II, LLC	754	816	(62)
Intrexon T1D Partners, LLC	368	1,462	(1,094)
Harvest Start-up Entities (1)	2,691	4,020	(1,329)
Other	796	2,741	(1,945)
Total	$14,324	$28,155	$(13,831)

(1) For the three months ended September 30, 2018 and 2017, revenues recognized from collaborations with Harvest start-up entities include: Thrive Agrobiotics, Inc.; Exotech Bio, Inc.; and AD Skincare, Inc. For the three months ended September 30, 2017, revenues recognized from collaborations with Harvest start-up entities also include Relieve Genetics, Inc.; Genten Therapeutics, Inc.; and CRS Bio, Inc.

Collaboration and licensing revenues decreased $13.8 million, or 49 percent, from the three months ended September 30, 2017 due to (i) a decrease in research and development services for certain of our ECCs as we redeployed certain resources towards supporting prospective new platforms and partnering opportunities and began to focus more on the further development of relationships and structures that provide us with more control and ownership over the development process and commercialization path, (ii) a decrease in research and development services for certain of our ECCs as a result of program progression where our collaborators have taken responsibility of the execution of the programs, (iii) changes in revenue recognition for upfront and milestone payments under the new ASC 606 revenue standard whereby revenues are recognized based on the amount of services we perform for our collaborators, and (iv) the mutual termination of our second ECC with ZIOPHARM for the treatment of graft-versus-host disease in December 2017.

Product revenues and gross margin

Product revenues were consistent period over period. Gross margin on products declined in the current period as a result of increased operating costs associated with new product offerings and cloned products.

Service revenues and gross margin

Service revenues were consistent period over period. Gross margin on services improved in the current period as a result of pricing changes and an increase in the number of embryos produced per bovine in vitro fertilization cycle performed due to improved production results.

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Research and development expenses

Research and development expenses increased $8.4 million, or 23 percent, over the three months ended September 30, 2017. Current period research and development expenses include $8.7 million expense related to in-process research and development reacquired from certain Harvest start-up entities as part of an asset acquisition in September 2018.

Selling, general and administrative expenses

SG&A expenses were consistent period over period although there were offsetting changes within individual components. Legal and professional fees decreased $2.9 million primarily due to decreased fees incurred for regulatory and other consultants. However, salaries, benefits and other personnel costs increased $2.6 million primarily due to increased compensation expenses related to performance and retention incentives for SG&A employees, partially offset by decreased share-based compensation expense as a result of certain 2014 stock option grants becoming fully vested in March 2018 and the impact of forfeited options from former employees.

Total other income (expense), net

Total other income (expense), net, decreased $9.8 million, or 161 percent, from the three months ended September 30, 2017. This decrease was primarily attributable to decreases in fair market value of our equity securities portfolio, investments in preferred stock, and other convertible instruments and an increase in interest expense associated with our Convertible Notes issued in July 2018.

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Comparison of the nine months ended September 30, 2018 and the nine months ended September 30, 2017

The following table summarizes our results of operations for the nine months ended September 30, 2018 and 2017, together with the changes in those items in dollars and as a percentage:

	Nine Months Ended September 30,		Dollar Change	Percent Change
	2018	2017		
	(In thousands)			
Revenues (1)				
Collaboration and licensing revenues (2)	$51,622	$89,384	$(37,762)	(42.2)%
Product revenues	23,549	25,780	(2,231)	(8.7)%
Service revenues	40,379	37,890	2,489	6.6 %
Other revenues	1,839	899	940	104.6 %
Total revenues	117,389	153,953	(36,564)	(23.8)%
Operating expenses				
Cost of products	28,046	25,625	2,421	9.4 %
Cost of services	21,127	21,805	(678)	(3.1)%
Research and development	124,072	104,663	19,409	18.5 %
Selling, general and administrative	112,872	113,258	(386)	(0.3)%
Total operating expenses	286,117	265,351	20,766	7.8 %
Operating loss	(168,728)	(111,398)	(57,330)	51.5 %
Total other income (expense), net	(13,911)	27,632	(41,543)	(150.3)%
Equity in loss of affiliates	(9,880)	(11,273)	1,393	(12.4)%
Loss before income taxes	(192,519)	(95,039)	(97,480)	102.6 %
Income tax benefit	19,535	2,164	17,371	>200%
Net loss	(172,984)	(92,875)	(80,109)	86.3 %
Net loss attributable to noncontrolling interests	4,113	3,123	990	31.7 %
Net loss attributable to Intrexon	$(168,871)	$(89,752)	$(79,119)	88.2 %

(1) Revenues in 2018 are accounted for under ASC 606, and revenues in 2017 are accounted for under ASC 605. We adopted ASC 606 on January 1, 2018 using the modified retrospective method, which applies the changes in accounting prospectively and does not restate prior periods.

(2) Including $41,740 and $77,937 from related parties for the nine months ended September 30, 2018 and 2017, respectively.

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Collaboration and licensing revenues

The following table shows the collaboration and licensing revenues recognized for the nine months ended September 30, 2018 and 2017, together with the changes in those items.

	Nine Months Ended September 30,		Dollar Change
	2018	2017	
	(In thousands)		
ZIOPHARM Oncology, Inc.	$13,626	$31,322	$(17,696)
Oragenics, Inc.	867	1,519	(652)
Fibrocell Science, Inc.	1,015	5,375	(4,360)
Genopaver, LLC	3,076	4,615	(1,539)
S & I Ophthalmic, LLC	—	751	(751)
OvaXon, LLC	—	1,966	(1,966)
Intrexon Energy Partners, LLC	3,345	8,909	(5,564)
Persea Bio, LLC	714	821	(107)
Ares Trading S.A.	7,525	8,474	(949)
Intrexon Energy Partners II, LLC	1,685	2,921	(1,236)
Intrexon T1D Partners, LLC	2,399	3,882	(1,483)
Harvest Start-up Entities (1)	11,792	11,835	(43)
Other	5,578	6,994	(1,416)
Total	$51,622	$89,384	$(37,762)

(1) For the nine months ended September 30, 2018 and 2017, revenues recognized from collaborations with Harvest start-up entities include: Thrive Agrobiotics, Inc.; Exotech Bio, Inc.; AD Skincare, Inc.; Genten Therapeutics, Inc.; and CRS Bio, Inc. For the nine months ended September 30, 2017, revenues recognized from collaborations with Harvest start-up entities also include Relieve Genetics, Inc.

Collaboration and licensing revenues decreased $37.8 million, or 42 percent, from the nine months ended September 30, 2017 due to (i) a decrease in research and development services for certain of our ECCs as we redeployed certain resources towards supporting prospective new platforms and partnering opportunities and began to focus more on the further development of relationships and structures that provide us with more control and ownership over the development process and commercialization path, (ii) a decrease in research and development services for certain of our ECCs as a result of program progression where our collaborators have taken responsibility of the execution of the programs, (iii) changes in revenue recognition for upfront and milestone payments under the new ASC 606 revenue standard whereby revenues are recognized based on the amount of services we perform for our collaborators, and (iv) the mutual termination of our second ECC with ZIOPHARM for the treatment of graft-versus-host disease in December 2017.

Product revenues and gross margin

Product revenues decreased $2.2 million, or 9 percent, from the nine months ended September 30, 2017. The decrease in product revenues was primarily due to lower customer demand for live calves, cows previously used in production, and cloned products. These decreases were partially offset by increased customer demand for pregnant recipients. Gross margin on products declined in the current period as a result of the lower product sales and increased operating costs associated with new product offerings and cloned products.

Service revenues and gross margin

Service revenues increased $2.5 million, or 7 percent, over the nine months ended September 30, 2017. The increase in service revenues and gross margin thereon relates to pricing changes and an increase in the number of embryos produced per bovine in vitro fertilization cycle performed due to improved production results.

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Research and development expenses

Research and development expenses increased $19.4 million, or 19 percent, over the nine months ended September 30, 2017. Current period research and development expenses include (i) $8.7 million expense related to in-process research and development reacquired from certain Harvest start-up entities as part of an asset acquisition in September 2018 which was immediately expensed and (ii) $5.3 million of one-time costs associated with closing one of Oxitec's Brazilian subsidiary's leased research and development facilities as we decentralized operations previously conducted in this facility. Research and development consultants and lab supplies increased $3.1 million primarily due to increased expenses from contract research organizations and consultants providing services for both programs being developed internally and with certain of our ECCs. Depreciation and amortization increased $2.1 million primarily as a result of depreciation expense on research and development assets and the amortization of developed technology acquired from GenVec, Inc. in June 2017.

Selling, general and administrative expenses

SG&A expenses were consistent period over period although there were offsetting changes within individual components. Legal and professional fees decreased $7.5 million primarily due to (i) decreased legal fees associated with ongoing litigation and (ii) decreased fees incurred for regulatory and other consultants. However, salaries, benefits and other personnel costs increased $6.9 million primarily due to increased compensation expenses related to performance and retention incentives for SG&A employees.

Total other income (expense), net

Total other income (expense), net, decreased $41.5 million, or 150 percent, from the nine months ended September 30, 2017. This decrease was primarily attributable to decreases in fair market value of our equity securities portfolio, investments in preferred stock, and other convertible instruments.

Liquidity and capital resources

Sources of liquidity

We have incurred losses from operations since our inception and as of September 30, 2018, we had an accumulated deficit of $990.1 million. From our inception through September 30, 2018, we have funded our operations principally with proceeds received from private and public offerings, cash received from our collaborators and through product and service sales made directly to customers. As of September 30, 2018, we had cash and cash equivalents of $82.4 million and short-term investments of $164.2 million. Cash in excess of immediate requirements is typically invested primarily in money market funds and U.S. government debt securities in order to maintain liquidity and preserve capital.

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

Cash flows

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

	Nine Months Ended September 30,	
	2018	2017
	(In thousands)	
Net cash provided by (used in):		
Operating activities	$ (86,878)	$ (69,840)
Investing activities	(181,954)	80,418
Financing activities	282,546	(9,420)
Effect of exchange rate changes on cash, cash equivalents, and restricted cash	578	892
Net increase in cash, cash equivalents and	$ 14,292	$ 2,050

restricted cash

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Cash flows from operating activities:

During the nine months ended September 30, 2018, our net loss was $173.0 million, which includes the following significant noncash expenses totaling $112.2 million: (i) $28.3 million of stock-based compensation expense, (ii) $27.6 million of noncash net unrealized and realized losses on our equity securities and preferred stock, (iii) $25.2 million of depreciation and amortization expense, (iv) $9.9 million of equity in net loss of affiliates, (v) $8.7 million of expense related to the reacquired in-process research and development in an asset acquisition, (vi) $8.4 million of shares issued as payment for services, and (vii) $4.1 million of losses on disposals of long-lived assets. These expenses were partially offset by $14.6 million of noncash dividend income and $19.3 million of noncash deferred tax benefits. Additionally, we had a $3.7 million net decrease in our operating assets and liabilities. During the nine months ended September 30, 2017, our net loss was $92.9 million, which includes the following significant noncash expenses totaling $74.5 million: (i) $31.9 million of stock-based compensation expense, (ii) $22.9 million of depreciation and amortization expense, (iii) $11.3 million of equity in net loss of affiliates, and (iv) $8.4 million of shares issued as payment for services. These expenses were partially offset by $12.3 million of noncash dividend income and $9.2 million of noncash net unrealized and realized gains on our equity securities and preferred stock. Additionally, we had a $28.6 million net increase in our operating assets and liabilities.

Cash flows from investing activities:

During the nine months ended September 30, 2018, we used $178.7 million for purchase of short-term investments, $30.4 million for purchases of property, plant and equipment and $14.1 million for investments in our JVs, and we received proceeds of $21.0 million from the maturity of short-term investments, $15.5 million in an asset acquisition, and $2.6 million from the return of the balance from an investment in an affiliate that was dissolved. During the nine months ended September 30, 2017, we received proceeds of $136.3 million from the maturity of short-term investments, and we used $32.7 million for purchases of property, plant and equipment, $14.2 million for the purchase of a land-based aquaculture facility by AquaBounty, and $10.6 million for investments in our JVs.

Cash flows from financing activities:

During the nine months ended September 30, 2018, we received $194.0 million net proceeds from the issuance of long-term debt in July and $88.0 net proceeds from public financings in January. During the nine months ended September 30, 2017, we paid $8.7 million of deferred consideration to former shareholders of an acquired business.

Future capital requirements

We established our strategy and business model of commercializing our technologies through collaborations with development expertise in 2010, and we consummated our first collaboration in January 2011. We believe that our efforts to partner our more mature programs and capabilities, to continue to consummate collaborations across our various industries, and to secure debt or equity financing for certain of our operating subsidiaries will result in additional capital in the future.

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

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

- progress in our research and development programs, as well as the magnitude of these programs;
- the timing, receipt and amount of any payments received in connection with strategic transactions;
- the timing, receipt and amount of upfront, milestone and other payments, if any, from present and future collaborators, if any;
- the timing, receipt and amount of sales and royalties, if any, from our potential products;
- our ability to maintain or improve the volume and pricing of our current product and service offerings and to develop new offerings, including those that may incorporate new technologies;

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- the timing and capital requirements to scale up our various product and service offerings and customer acceptance thereof;
- our ability to maintain and establish additional collaborative arrangements and/or new strategic initiatives;
- the timing of regulatory approval of products of our collaborations and operations;
- the resources, time and cost required for the preparation, filing, prosecution, maintenance and enforcement of patent claims;
- investments we may make in current and future collaborators, including JVs;
- strategic mergers and acquisitions, including both the upfront acquisition cost as well as the cost to integrate, maintain, and expand the strategic target; and
- the costs associated with legal activities, including litigation, arising in the course of our business activities and our ability to prevail in any such legal disputes.

Until such time, if ever, as we can regularly generate positive operating cash flows, we may finance our cash needs through a combination of equity offerings, debt financings, government or other third-party funding, strategic alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interests of our common shareholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our common shareholders. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through government or other third-party funding, marketing and distribution arrangements or other strategic transactions, collaborations, or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us.

Contractual obligations and commitments

The following table summarizes our significant contractual obligations and commitments as of September 30, 2018 and the effects such obligations are expected to have on our liquidity and cash flows in future periods:

	Total	Less Than 1 Year	1 - 3 Years	3 - 5 Years	More Than 5 Years
	(In thousands)				
Operating Leases	$75,817	$8,418	$18,844	$15,384	$33,171
Purchase commitments	8,826	4,048	4,778	—	—
Convertible debt	230,060	—	30,060	200,000	—
Cash interest payable on convertible debt	34,981	6,981	14,000	14,000	—
Long-term debt, excluding convertible debt	5,632	546	1,256	757	3,073
Contingent consideration	585	—	585	—	—
Total	$355,901	$19,993	$69,523	$230,141	$36,244

In addition to the obligations in the table above, as of September 30, 2018 we also have the following significant contractual obligations described below.

In conjunction with the formation of our JVs, we committed to making future capital contributions of at least $35.0 million to the JVs, subject to certain conditions and limitations. As of September 30, 2018, our remaining capital contribution commitments to our JVs were $15.1 million. These future capital contributions are not included in the table above due to the uncertainty of the timing and amounts of such contributions.

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We are party to in-licensed research and development agreements with various academic and commercial institutions where we could be required to make future payments for annual maintenance fees as well as for milestones and royalties we might receive upon commercial sales of products that incorporate their technologies. These agreements are generally subject to termination by us and therefore no amounts are included in the tables above. At September 30, 2018, we also had research and development commitments with third parties totaling $15.9 million that had not yet been incurred.

In January 2015, we and ZIOPHARM jointly entered into a license agreement with the University of Texas MD Anderson Cancer Center, or MD Anderson, whereby we received an exclusive license to certain technologies owned by MD Anderson. As a result of the new license with ZIOPHARM ("Notes to the Consolidated Financial Statements (Unaudited) - Note 19" appearing elsewhere in this Quarterly Report), ZIOPHARM receives access to these technologies pursuant to the terms of the new license. We and ZIOPHARM are obligated to reimburse MD Anderson for out of pocket expenses for maintaining patents covering the licensed technologies. These reimbursements are not included in the table above due to the uncertainty of the timing and amounts of such reimbursements.

As part of our August 2014 acquisition of Trans Ova, we agreed to pay a portion of certain cash proceeds received from the litigation with XY, LLC. These amounts are not included in the table above due to the uncertainty of whether and when any amounts may be due.

In conjunction with a prior transaction associated with Trans Ova's subsidiary, ViaGen, in September 2012, we may be obligated to make certain future contingent payments to the former equity holders of ViaGen, up to a total of $3.0 million if certain revenue targets, as defined in the share purchase agreement, are met. This amount is not included in the table above due to the uncertainty of when we will make any of these future payments, if ever.

In January 2009, AquaBounty was awarded a grant to provide funding of a research and development project from the Atlantic Canada Opportunities Agency, a Canadian government agency. Amounts claimed by AquaBounty must be repaid in the form of a 10 percent royalty on any products commercialized out of this research and development project until fully paid. Because the timing of commercialization is subject to additional regulatory considerations, the timing of repayment is uncertain. AquaBounty claimed all amounts available under the grant, resulting in total long-term debt of $2.1 million on our consolidated balance sheet as of September 30, 2018. This amount is not included in the table above due to the uncertainty of the timing of repayment.

Net operating losses

As of September 30, 2018, we had net operating loss carryforwards of approximately $357.0 million for U.S. federal income tax purposes available to offset future taxable income, and U.S. federal and state research and development tax credits of approximately $7.9 million, prior to consideration of annual limitations that may be imposed under Section 382 of the Internal Revenue Code of 1986, as amended, or Section 382. These carryforwards begin to expire in 2022. Our direct foreign subsidiaries have foreign loss carryforwards of approximately $159.7 million, most of which do not expire. Excluding certain deferred tax liabilities totaling $9.4 million, our remaining net deferred tax assets, which primarily relate to these loss carryforwards, are offset by a valuation allowance due to our history of net losses.

As a result of our past issuances of stock, as well as due to prior mergers and acquisitions, certain of our net operating losses have been subject to limitations pursuant to Section 382. As of September 30, 2018, Intrexon has utilized all net operating losses subject to Section 382 limitations, other than those losses inherited via acquisitions. As of September 30, 2018, approximately $41.9 million of domestic net operating losses were inherited via acquisitions and are limited based on the value of the target at the time of the transaction. Future changes in stock ownership may also trigger an ownership change and, consequently, a Section 382 limitation.

The Tax Cuts and Jobs Act of 2017 introduced certain limitations on utilization of net operating losses that are generated after 2017, generally limiting utilization of those losses to 80 percent of future annual taxable income. However, losses generated after 2017 will generally have an indefinite carryforward period.

Off-balance sheet arrangements

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

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Critical accounting policies and estimates

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

There have been no material changes to our critical accounting policies from those described in "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in our Annual Report, except as follows:

Revenue Recognition

Effective January 1, 2018, we apply ASC 606. Under ASC 606, we recognize revenue when our customer obtains control of the promised goods or services, in an amount that reflects the consideration that we expect to receive in exchange for those goods or services. To determine revenue recognition for arrangements that are within the scope of ASC 606, we perform the following five steps: (i) identify the contract(s) with a customer, (ii) identify the promises and distinct performance obligations in the contract, (iii) determine the transaction price, (iv) allocate the transaction price to the performance obligations in the contract, and (v) recognize revenue when (or as) we satisfy the performance obligations.

Our revenue recognition accounting policies for periods prior to January 1, 2018 can be found in the audited consolidated financial statements and related notes thereto included in our Annual Report.

Collaboration and licensing revenues

We generate collaboration and licensing revenues through the execution of agreements with collaborators, known as ECCs, and licensing agreements whereby the collaborators or the licensee obtain exclusive access to our proprietary technologies for use in the research, development and commercialization of products and/or treatments in a contractually specified field of use. Generally, the terms of these agreements provide that we receive some or all of the following: (i) upfront payments upon consummation of the agreement; (ii) reimbursements for costs incurred by us for research and development and/or manufacturing efforts related to specific applications provided for in the agreement; (iii) milestone payments upon the achievement of specified development, regulatory and commercial activities; and (iv) royalties on sales of products arising from the collaboration or licensing agreement. The agreement typically continues in perpetuity unless terminated and each of our collaborators retains a right to terminate the agreement upon providing us written notice a certain period of time prior to such termination, generally 90 days.

Our collaboration and licensing agreements typically contain multiple promises, including technology licenses, research and development services, and in certain cases manufacturing services. We determine whether each of the promises is a distinct performance obligation. As the nature of the promises in our collaboration and licensing agreements are highly integrated and interrelated, we typically combine most of our promises into a single performance obligation. Because we are performing research and development services during early-stage development, the services are integral to the utilization of the technology license. Therefore, we have determined that the technology license and research and development services are typically inseparable from each other during the performance period of our collaboration and licensing agreements. Contingent manufacturing services that may be provided under certain of our agreements are considered to be a separate future contract and not part of the current collaboration or licensing agreement.

At contract inception, we determine the transaction price, including fixed consideration and any estimated amounts of variable consideration. The upfront payment received upon consummation of the agreement is fixed and nonrefundable. Variable consideration is subject to a constraint and amounts are included in the transaction price to the extent that it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur

when the uncertainty associated with the variable consideration is subsequently resolved. Variable consideration may include reimbursements for costs incurred by us for research and development efforts, milestone payments upon the achievement of certain development, regulatory and commercial activities, and royalties on sales of products arising from the collaboration or licensing agreement. We determine the initial transaction price and exclude variable consideration that is otherwise constrained pursuant to the guidance in ASC 606.

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The transaction price is allocated to the performance obligations in the agreement based on the standalone selling price of each performance obligation. We typically group the promises in our collaboration and licensing agreements into one performance obligation so the entire transaction price relates to this single performance obligation. The technology license included in the single performance obligation is considered a functional license. However, it is typically combined into a single performance obligation as we provide interrelated research and development services along with other obligations over an estimated period of performance. We utilize judgment to determine the most appropriate method to measure our progress of performance under the agreement, primarily based on inputs necessary to fulfill the performance obligation. We evaluate our measure of progress to recognize revenue each reporting period and, if necessary, adjust the measure of performance and related revenue recognition. Our measure of performance and revenue recognition involves significant judgment and assumptions, including, but not limited to, estimated costs and timelines to complete our performance obligations. We evaluate modifications and amendments to our contracts to determine whether any changes should be accounted for prospectively or on a cumulative catch-up basis.

Payments received for cost reimbursements for research and development efforts are recognized as revenue as the services are performed, in connection with the single performance obligation discussed above. The reimbursements relate specifically to our efforts to provide services and the reimbursements are consistent with what we would typically charge other collaborators for similar services.

Milestone payments are evaluated at the inception of the agreement to determine whether the milestones are considered probable of being achieved. We typically determine that the milestones are not probable at inception of the agreement due to the uncertainty of when and if the milestone will be achieved.

Royalties, including sales-based milestones, received under the agreements will be recognized as revenue when sales have occurred because we apply the sales- or usage-based royalties recognition exception provided for under ASC 606. We determined the application of this exception is appropriate because at the time the royalties are generated, the technology license granted in the agreement is the predominant item to which the royalties relate.

As we receive upfront payments in our collaboration and licensing agreements, we evaluate whether any significant financing components exist in our collaboration and licensing agreements. Based on the nature of our collaboration and licensing agreements, there are no significant financing components as the purpose of the upfront payment is not to provide financing. The purpose is to provide the collaborator with assurance that we will complete our obligations under the contract or to secure the right to a specific product or service at the collaborator's discretion. In addition, the variable payments generally align with the timing of performance or the timing of the consideration varies on the basis of the occurrence or nonoccurrence of a future event that is not substantially within the control of the collaborator or us.

From time to time, we and certain collaborators may cancel our agreements, relieving us of any further performance obligations under the agreement. Upon such cancellation or when we have determined no further performance obligations are required of us under an agreement, we recognize any remaining deferred revenue.

Product and service revenues

We generate product and service revenues primarily through sales of products and services that are created from technologies developed or owned by us. Our current offerings include sales of advanced reproductive technologies, including our bovine embryo transfer and in vitro fertilization processes and from genetic preservation and sexed semen processes and applications of such processes to other livestock, as well as sales of livestock and embryos produced using these processes and used in production. As each promised product or service is distinct, we recognize the transaction price as revenue when the customer takes ownership of the promised product or when the promised service is rendered. Payment terms are typically due within 30 days.

Recent accounting pronouncements

For information with respect to recent accounting pronouncements and the impact of these pronouncements on our consolidated financial statements, see "Notes to the Consolidated Financial Statements (Unaudited) - Note 2" appearing elsewhere in this Quarterly Report.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

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

Interest rate risk

We had cash, cash equivalents and short-term investments of $246.6 million and $74.4 million at September 30, 2018 and December 31, 2017, respectively. Our cash and cash equivalents and short-term investments consist of cash, money market funds, U.S. government debt securities, and certificates of deposit. The primary objectives of our investment activities are to preserve principal, maintain liquidity and maximize income without significantly increasing risk. Our investments consist of U.S. government debt securities and certificates of deposit, which may be subject to market risk due to changes in prevailing interest rates that may cause the fair values of our investments to fluctuate. We believe that a hypothetical 100 basis point increase in interest rates would not materially affect the fair value of our interest-sensitive financial instruments and any such losses would only be realized if we sold the investments prior to maturity.

Investments in publicly traded companies' common stock

We have common stock investments in several publicly traded companies that are subject to market price volatility. We have adopted the fair value method of accounting for these investments, except for our investment in AquaBounty as further described below, and therefore, have recorded them at fair value at the end of each reporting period with the unrealized gain or loss recorded as a separate component of other income, net for the period. As of September 30, 2018 and December 31, 2017, the original aggregate cost basis of these investments was $100.1 million and $102.6 million, respectively, and the market value was $4.7 million and $15.1 million, respectively. The fair value of these investments is subject to fluctuation in the future due to the volatility of the stock market, changes in general economic conditions and changes in the financial conditions of these companies. The fair value of these investments as of September 30, 2018 would be approximately $5.2 million and $3.8 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the value of the investments. The fair value of these investments as of December 31, 2017 would be approximately $16.6 million and $12.1 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the value of the investments.

The common stock of AquaBounty is traded on the NASDAQ Stock Market. As of September 30, 2018, we owned 6,700,738 shares, or approximately 52 percent. The fair value of our investment in AquaBounty as of September 30, 2018 and December 31, 2017 was $21.5 million and $18.2 million, respectively, based on AquaBounty's quoted closing price on the NASDAQ Stock Market. The fair value of our investment in AquaBounty as of September 30, 2018 would be approximately $23.7 million and $17.2 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the share price of AquaBounty. The fair value of our investment in AquaBounty as of December 31, 2017 would be approximately $20.0 million and $14.6 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the share price of AquaBounty.

Investments in publicly traded companies' preferred stock

We have preferred stock investments in several publicly traded companies, most of which may be converted to common stock in the future. We have adopted the fair value method of accounting for these investments whereby the value of preferred stock is adjusted to fair value as of each reporting date. As of September 30, 2018 and December 31, 2017, the original cost basis of these investments, including dividends, was $162.9 million and $148.3 million, respectively, and the fair value of these investments was $158.4 million and $161.2 million, respectively. The fair value of these investments is subject to fluctuation in the future due to, among other things, the likelihood and timing of conversion of the preferred stock into common stock, the volatility of each company's common stock, and changes in general economic and financial conditions of these companies. The fair value of these investments as of September 30, 2018 would be approximately $174.2 million and $126.7 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the value of the investments. The fair value of these investments as of December 31, 2017 would be approximately $177.3 million and $129.0 million, respectively, based on a hypothetical 10 percent increase or 20 percent decrease in the value of the investments. In October 2018, we retired our ZIOPHARM preferred shares which had a fair value as of September 30, 2018 of $158.1 million.

Foreign currency exchange risk

We have international subsidiaries in Belgium, Brazil, Canada, England, and Hungary. These subsidiaries' assets, liabilities, and current revenues and expenses are denominated in their respective foreign currency. We do not hedge our foreign currency

exchange rate risk. The effect of a hypothetical 10 percent change in foreign currency exchange rates applicable to our business would not have a material impact on our consolidated financial statements.

Item 4. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our principal executive and financial officers, evaluated the effectiveness of our disclosure controls and procedures as of September 30, 2018. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Our principal executive and financial officers have concluded that, as of September 30, 2018, our disclosure controls and procedures were not effective because of the material weakness in internal control over financial reporting described below.

Material Weakness in Internal Control Over Financial Reporting

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the annual or interim financial statements will not be prevented or detected on a timely basis.

We did not maintain effective internal controls related to the adoption of ASC 606. Specifically, we did not design controls which were sufficiently precise to identify and account for the impacts of adopting ASC 606 on our open ECCs, including gross versus net presentation for payments pursuant to one of the Company's contracts, the guidance for contract modifications to a contract that had been modified prior to the adoption of ASC 606, and the measurement of progress for performance obligations satisfied over time. This control deficiency resulted in the misstatement of accumulated deficit, deferred revenue, and collaboration and licensing revenues, and restatement of the Company's consolidated financial statements for the quarter ended March 31, 2018.

Additionally, this control deficiency could result in a misstatement of the aforementioned account balances or disclosures that would result in a material misstatement to the annual or interim consolidated financial statements that would not be prevented or detected. Accordingly, our management has determined that this control deficiency constitutes a material weakness.

Changes in Internal Control Over Financial Reporting

As described below, we have begun to implement changes to our controls and procedures to address the material weakness in our internal controls over financial reporting. Other than the changes noted below, there have been no changes in our internal control over financial reporting during the three months ended September 30, 2018, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Management's Plan for Remediation of Material Weakness

Management's planned actions to address the material weakness described above include (a) engagement of third-party technical accounting advisors on any future complex matters which fall within the scope of ASC 606, (b) design and implementation of a more precise review framework whereby our advisors will provide a more detailed assessment of how ASC 606 applies to all key elements of our contracts with customers and (c) design procedures for a comprehensive review of such deliverables and conclusions by management via a sufficiently detailed analysis of the relevant contracts, amendments, accounting guidance and related interpretations.

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PART II. OTHER INFORMATION

Item 1. Legal Proceedings

From time to time, we are involved in litigation or legal matters, including governmental investigations. While the outcome of these matters cannot be predicted with certainty, we do not currently expect that any ongoing matters will have a material adverse effect on our business or financial position. However, should one or more of these matters be resolved in a manner different than our current expectation, the effect on our operations or financial position could be material.

We previously disclosed that in January 2017, the Division of Enforcement of the SEC informed us of an investigation that we believe concerned certain issues raised by a previously disclosed consolidated putative shareholder class action lawsuit that was dismissed on November 1, 2017, and a previously disclosed shareholder derivative action that was dismissed on January 25, 2018. In September 2018, the Division of Enforcement informed us that it had concluded its investigation of these matters and that the Division of Enforcement does not intend to recommend enforcement action against us based on the investigation.

Item 1A. Risk Factors

As disclosed in "Item 1A. Risk Factors" in our Annual Report, there are a number of risks and uncertainties that may have a material effect on the operating results of our business and our financial condition. There are no additional material updates or changes to our risk factors since the filing of our Annual Report, except as follows:

Servicing our debt requires a significant amount of cash, and we may not have sufficient cash flow from our business to pay our substantial debt.

Our ability to make scheduled payments of the principal of, to pay interest on or to refinance our indebtedness, including the Convertible Notes, depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not continue to generate cash flow from operations in the future sufficient to service our debt and make necessary capital expenditures. If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring debt or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to refinance our indebtedness will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

In addition, the Convertible Notes are our obligations exclusively and are not guaranteed by any of our operating subsidiaries. A substantial portion of our consolidated assets is held by our subsidiaries. Accordingly, our ability to service our debt, including the Convertible Notes, depends on the results of operations of our subsidiaries and upon the ability of such subsidiaries to provide us with cash, whether in the form of dividends, loans or otherwise, to pay amounts due on our obligations, including the Convertible Notes. Our subsidiaries are separate and distinct legal entities and have no obligation, contingent or otherwise, to make payments on the Convertible Notes or to make any funds available for that purpose. In addition, dividends, loans or other distributions to us from such subsidiaries may be subject to contractual and other restrictions and are subject to other business considerations.

Despite our current debt levels, we may still incur substantially more debt or take other actions that would intensify the risks discussed above.

Despite our current consolidated debt levels, we and our subsidiaries may be able to incur substantial additional debt in the future, subject to the restrictions contained in our debt instruments, some of which may be secured debt. We are not restricted under the terms of the indenture governing the Convertible Notes from incurring additional debt, securing existing or future debt, recapitalizing our debt or taking a number of other actions that are not limited by the terms of the indenture governing the Convertible Notes that could have the effect of diminishing our ability to make payments on the Convertible Notes when due.

We may not have the ability to raise the funds necessary to settle conversions of the Convertible Notes in cash or to repurchase the Convertible Notes upon a fundamental change, and our future debt may contain limitations on our ability to pay cash upon conversion or repurchase of the Convertible Notes.

Holders of Convertible Notes have the right to require us to repurchase their Convertible Notes upon the occurrence of a fundamental change at a fund