UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended December 31, 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: 001-38720

Twist Bioscience Corporation
(Exact Name of Registrant as Specified in its Charter)

Delaware	**46-205888**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

455 Mission Bay Boulevard South, Suite 545, San Francisco, CA 94158
(Address of principal executive offices and zip code)

(800) 719-0671
(Registrant's telephone number, including area code)

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 ☒ 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 ☒ 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. (Check one):

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Small 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 ☒

The number of shares of the Registrant's common stock outstanding as of February 1, 2019, was 28,017,924.

TWIST BIOSCIENCE CORPORATION

QUARTERLY REPORT ON FORM 10-Q
FOR THE QUARTER ENDED DECEMBER 31, 2018

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Forward-looking statements

This Quarterly Report on Form 10-Q for the Quarter ended December 31, 2018, or Form 10-Q, contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. The words “believe,” “will,” “may,” “estimate,” “continue,” “anticipate,” “intend,” “should,” “plan,” “expect,” “predict,” “could,” “potentially” and variations of such words and similar expressions are intended to identify such forward-looking statements, which may include, but are not limited to, statements concerning the following:

- our ability to increase our revenue and our revenue growth rate;
- estimates of our expenses, future revenues, capital requirements and our needs for additional financing; our estimates of the size of our market opportunities;
- our expectations regarding our ability to increase DNA production, reduce turnaround times and drive cost reductions for our customers;
- our ability to effectively manage our growth;
- our ability to successfully enter new markets and manage our international expansion;
- our ability to protect our intellectual property, including our proprietary DNA synthesis platform;
- costs associated with defending intellectual property infringement and other claims;
- the effects of increased competition in our business;
- our ability to keep pace with changes in technology and our competitors;
- our ability to successfully identify, evaluate and manage any future acquisitions of businesses, solutions or technologies;
- the success of our marketing efforts;
- the potential purchases of common stock by certain of our existing stockholders and their affiliated entities, including stockholders who are associated with certain of our directors;
- significant disruption in, or breach in security of our information technology systems and resultant interruptions in service and any related impact on our reputation;
- the attraction and retention of qualified employees and key personnel;
- the effects of natural or man-made catastrophic events;
- the effectiveness of our internal controls;
- changes in government regulation affecting our business;
- the impact of adverse economic conditions; and
- other risk factors included under the section titled “Risk Factors.”

You should not rely upon forward-looking statements as predictions of future events. Such statements are based on management’s expectations as of the date of this filing and involve many risks and uncertainties that could cause our actual results, events or circumstances to differ materially from those expressed or implied in our forward-looking statements. Such risks and uncertainties include those described throughout this report and particularly in the sections entitled “Risk factors” and “Management’s discussion and analysis of financial condition and results of operations.” Given these risks and uncertainties, readers are cautioned not to place undue reliance on such forward-looking statements. Readers are urged to carefully review and consider all of the information in this Form 10-Q and in other documents we file from time to time with the Securities and Exchange Commission, or SEC. We undertake no obligation to update any forward-looking statements made in this Form 10-Q to reflect events or circumstances after the date of this filing or to reflect new information or the occurrence of unanticipated events, except as required by law. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make.

When we use the terms ““Twist,” “Twist Bioscience,” the “Company,” “we,” “us” or “our” in this report, we are referring to Twist Bioscience Corporation and its consolidated subsidiaries unless the context requires otherwise. Sequencespace and the Twist logo are trademarks of Twist Bioscience Corporation. All other company and product names may be trademarks of the respective companies with which they are associated.

Item 1. ***Financial statements***

Twist Bioscience Corporation
Condensed Consolidated Balance Sheets (unaudited)

(In thousands, except share and per share amounts)	September 30, 2018	December 31, 2018
Assets		
Current assets		
Cash and cash equivalents	$ 80,757	$ 66,459
Short-term investments	—	63,707
Accounts receivable, net	5,419	6,978
Inventory	6,028	5,561
Prepaid expenses and other current assets	3,467	3,958
Total current assets	$ 95,671	$ 146,663
Property and equipment, net	12,331	13,596
Goodwill	1,138	1,138
Intangible assets, net	712	661
Restricted cash, non-current	579	579
Other non-current assets	5,360	1,816
Total assets	$ 115,791	$ 164,453
Current liabilities		
Accounts payable	$ 7,531	$ 6,725
Accrued expenses	2,166	2,606
Accrued payroll	5,401	5,261
Current portion of long-term debt	2,500	3,333
Other current liabilities	939	1,073
Total current liabilities	$ 18,537	$ 18,998
Redeemable convertible preferred stock warrant liability	631	—
Long-term debt, net of current portion	7,218	6,526
Other non-current liabilities	344	333
Total liabilities	$ 26,730	$ 25,857
Commitments and contingencies (Note 6)		
Redeemable convertible preferred stock		
Series A redeemable convertible preferred stock, $0.00001 par value—2,854,576 shares and no shares authorized as of September 30, 2018 and December 31, 2018, respectively; 2,817,723 shares and no shares issued and outstanding as of September 30, 2018 and December 31, 2018 respectively.	$ 9,141	$ —
Series B redeemable convertible preferred stock, $0.00001 par value—3,331,878 shares and no shares authorized as of September 30, 2018 and December 31, 2018, respectively; 3,315,645 shares and no shares issued and outstanding as of September 30, 2018 and December 31, 2018, respectively.	25,900	—
Series C redeemable convertible preferred stock, $0.00001 par value—2,510,354 shares and no shares authorized as of September 30, 2018 and December 31, 2018, respectively; 2,491,483 shares and no shares issued and outstanding as of September 30, 2018 and December 31, 2018, respectively.	36,726	—
Series D redeemable convertible preferred stock, $0.00001 par value—10,475,252 shares and no shares authorized as of September 30, 2018 and December 31, 2018, respectively; 10,326,454 shares and no shares issued and outstanding as of September 30, 2018 and December 31, 2018, respectively.	218,716	—
Total redeemable convertible preferred stock	$ 290,483	$ —
Stockholders' equity (deficit)		
Preferred stock, $0.00001 par value—no shares and 10,000,000 shares authorized as of September 30, 2018 and December 31, 2018, respectively; no shares issued or outstanding as of September 30, 2018 and December 31, 2018, respectively.	$ —	$ —
Common stock, $0.00001 par value—27,775,000 and 100,000,000 shares authorized as of September 30, 2018 and December 31, 2018, respectively; 3,206,048 and 28,012,874 shares issued and outstanding as of September 30, 2018 and December 31, 2018, respectively.	—	—
Additional paid-in capital	9,346	372,066
Accumulated other comprehensive income	87	24
Accumulated deficit	(210,855)	(233,494)
Total stockholders' equity (deficit)	$ (201,422)	$ 138,596
Total liabilities, redeemable convertible preferred stock and stockholders' equity (deficit)	$ 115,791	$ 164,453

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

Twist Bioscience Corporation
Condensed Consolidated Statements of Operations and Comprehensive Loss (unaudited)

(In thousands, except share and per share amounts)	Three months ended December 31, 2017	2018
Revenues	$ 4,313	$ 11,492
Operating expenses:		
Cost of revenues	$ 7,498	$ 11,857
Research and development	4,303	7,273
Selling, general and administrative	9,263	15,259
Total operating expenses	$ 21,064	$ 34,389
Loss from operations	$ (16,751)	$ (22,897)
Interest income	158	664
Interest expense	(273)	(348)
Other income (expense), net	(19)	(15)
Loss before income taxes	$ (16,885)	$ (22,596)
Provision for income taxes	(52)	(43)
Net loss attributable to common stockholders	$ (16,937)	$ (22,639)
Other comprehensive loss:		
Change in unrealized loss on investments	(1)	(7)
Foreign currency translation adjustment	10	(56)
Comprehensive loss	$ (16,928)	$ (22,702)
Net loss per share attributable to common stockholders—basic and diluted	$ (6.42)	$ (1.18)
Weighted average shares used in computing net loss per share attributable to common stockholders—basic and diluted	2,638,068	19,187,533

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

Twist Bioscience Corporation
Condensed Consolidated Statements of Redeemable Convertible Preferred Stock and Stockholders' Equity (Deficit) (unaudited)

(In thousands, except share data)	Series A convertible preferred stock		Series B convertible preferred stock		Series C convertible preferred stock		Series D convertible preferred stock		Common stock		Additional paid-in capital	Other comprehensive income	Accumulated deficit	Total stockholders' equity (deficit)
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount				
Balances as of September 30, 2017	2,817,723	$ 9,141	3,315,645	$ 25,900	2,491,483	$ 36,726	6,034,089	$ 127,866	3,178,819	$ —	$ 6,228	$ 33	$ (139,619)	$ (133,358)
Issuance of Series D redeemable convertible preferred stock, net of financing costs of $10	—	—	—	—	—	—	141,212	2,990	—	—	—	—	—	—
Exercise of stock options	—	—	—	—	—	—	—	—	33,906	—	47	—	—	47
Repurchases of early exercised common stock options	—	—	—	—	—	—	—	—	(757)	—	—	—	—	—
Stock based compensation	—	—	—	—	—	—	—	—	—	—	536	—	—	536
Other comprehensive income	—	—	—	—	—	—	—	—	—	—	—	9	—	9
Net loss	—	—	—	—	—	—	—	—	—	—	—	—	(16,937)	(16,937)
Balances as of December 31, 2017	2,817,723	$ 9,141	3,315,645	$ 25,900	2,491,483	$ 36,726	6,175,301	$ 130,856	3,211,968	$ —	$ 6,811	$ 42	$ (156,556)	$ (149,703)

(In thousands, except share data)	Series A convertible preferred stock		Series B convertible preferred stock		Series C convertible preferred stock		Series D convertible preferred stock		Common stock		Additional paid-in capital	Other comprehensive income	Accumulated deficit	Total stockholders' equity (deficit)
	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount	Shares	Amount				
Balances as of September 30, 2018	2,817,723	$ 9,141	3,315,645	$ 25,900	2,491,483	$ 36,726	10,326,454	$ 218,716	3,206,048	$ —	$ 9,346	$ 87	$ (210,855)	$ (201,422)
Issuance of common stock in public offering, net of underwriting discounts, commissions and offering expenses of $10,903	—	—	—	—	—	—	—	—	5,750,000	—	69,597	—	—	69,597
Exercise of stock options	—	—	—	—	—	—	—	—	48,841	—	166	—	—	166
Conversion of redeemable convertible preferred stock warrant liability to equity	—	—	—	—	—	—	—	—	—	—	631	—	—	631
Conversion of redeemable convertible preferred stock to common stock	(2,817,723)	(9,141)	(3,315,645)	(25,900)	(2,491,483)	(36,726)	(10,326,454)	(218,716)	18,951,305	—	290,462	—	—	290,462
Repurchases of early exercised common stock options	—	—	—	—	—	—	—	—	(442)	—	—	—	—	—
Net exercise of stock warrants	—	—	—	—	—	—	—	—	57,122	—	—	—	—	—
Stock based compensation	—	—	—	—	—	—	—	—	—	—	1,864	—	—	1,864
Other comprehensive income	—	—	—	—	—	—	—	—	—	—	—	(63)	—	(63)
Net loss	—	—	—	—	—	—	—	—	—	—	—	—	(22,639)	(22,639)
Balances as of December 31, 2018	—	$ —	—	$ —	—	$ —	—	$ —	28,012,874	$ —	$ 372,066	$ 24	$ (233,494)	$ 138,596

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

Twist Bioscience Corporation
Condensed Consolidated Statements of Cash Flows (unaudited)

(in thousands)	Three months ended December 31, 2017(1)	2018
Cash flows from operating activities		
Net loss	$ (16,937)	$ (22,639)
Adjustments to reconcile net loss to net cash used in operating activities		
Depreciation and amortization	1,286	1,472
Loss on disposal of property and equipment	—	8
Stock-based compensation	536	1,864
Non-cash interest expense	17	64
Change in fair value of redeemable convertible preferred stock warrant liability	(2)	—
Amortization of debt discount	93	78
Changes in assets and liabilities, net of impact of business combination:		
Accounts receivable, net	(677)	(1,559)
Inventory	(446)	467
Prepaid expenses and other current assets	90	(366)
Other non-current assets	(111)	(392)
Accounts payable	954	(715)
Accrued expenses	(662)	39
Accrued payroll	(72)	(140)
Other liabilities	(85)	135
Net cash used in operating activities	(16,016)	(21,684)
Cash flows from investing activities		
Purchases of property and equipment	(1,511)	(1,922)
Purchases of investments	(3,374)	(63,835)
Maturity of investments	13,100	—
Net cash provided by (used in) investing activities	8,215	(65,757)
Cash flows from financing activities		
Proceeds from issuance of common stock and exercise of stock options	142	220
Proceeds from initial public offering, net of underwriting discounts, commissions and offering expenses	—	72,779
Proceeds from issuance of Series D redeemable convertible preferred stock, net of issuance costs	2,990	—
Payments of deferred offering costs	(470)	—
Net cash provided by financing activities	2,662	72,999
Net decrease in cash, cash equivalents, and restricted cash	(5,139)	(14,442)
Cash, cash equivalents, and restricted cash at beginning of period	31,429	81,537
Cash, cash equivalents, and restricted cash at end of period	26,290	67,095
Supplemental disclosure of cash flow information		
Interest paid	203	207
Income taxes paid, net of refunds	5	53
Non-cash investing and financing activities		
Property and equipment additions included in accounts payable and accrued expenses	226	1,117
Deferred offering costs included in accounts payable and accrued expenses	87	826
Conversion of redeemable convertible preferred stock warrant liability to equity	—	631
Conversion of redeemable convertible preferred stock to common stock	—	290,462

(1) Adjusted to reflect the retrospective adoption of Accounting Standards Update (ASU) 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash.

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

Notes to Unaudited Condensed Consolidated Financial Statements

1. The Company

Twist Bioscience Corporation (the Company) was incorporated in the state of Delaware on February 4, 2013. The Company is a synthetic biology company that has developed a disruptive DNA synthesis platform. The Company's fiscal year ends September 30.

The Company has generated net losses in all periods since inception. As of December 31, 2018, the Company had an accumulated deficit of $233.5 million and has not generated positive cash flows from operations since inception. Losses are expected to continue as the Company continues to invest in product development, manufacturing, and sales and marketing.

The Company has raised multiple rounds of debt and equity financing since its inception. In October 2018, the Company completed an initial public offering (IPO) of its common stock which raised proceeds of $69.6 million, after deducting underwriting discounts, commissions and offering expenses. Management believes that these proceeds combined with existing cash and short-term investment balances on hand will be sufficient to fund operations for at least one year from the issuance of these unaudited condensed consolidated financial statements. However, there can be no assurance that additional financing will not be required or that the Company will be successful in raising additional capital on terms which are acceptable to the Company.

If the Company requires but is unable to obtain additional funding, the Company could be forced to delay, reduce or eliminate some or all of its research and development programs, product portfolio expansion or commercialization efforts, which could adversely affect its business prospects, or the Company may be unable to continue operations.

2. Summary of significant accounting policies

Basis of presentation and use of estimates

The accompanying unaudited condensed consolidated financial statements were prepared in accordance with accounting principles generally accepted in the United States of America (GAAP) for interim financial information. Certain information and disclosures normally included in the consolidated financial statements prepared in accordance with GAAP have been condensed or omitted. Accordingly, these unaudited condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and the related notes included in the Annual Report on Form 10-K for the fiscal year ended September 30, 2018 (the Annual Report on Form 10-K) filed with the Securities and Exchange Commission on December 20, 2018. The condensed consolidated financial statements are unaudited and have been prepared on a basis consistent with that used to prepare the audited annual consolidated financial statements and include, in the opinion of management, all adjustments, consisting of normal and recurring items, necessary for the fair statement of the condensed consolidated financial statements. The condensed consolidated balance sheet at September 30, 2018 was derived from audited consolidated financial statements, but does not include all disclosures required by GAAP. The operating results for the quarter ended December 31, 2018 are not necessarily indicative of the results expected for the full year ending September 30, 2019.

The presentation of unaudited condensed consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as of the date of the condensed consolidated financial statements and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates. The Company's unaudited condensed consolidated financial statements include its wholly-owned subsidiaries. All intercompany balances and accounts are eliminated in consolidation.

Significant accounting policies

There have been no material changes in the accounting policies from those disclosed in the audited consolidated financial statements and the related notes included in the Annual Report on Form 10-K.

Reverse stock split

In October 2018, the Company's stockholders approved a one-for-0.101 reverse stock split of its common and redeemable convertible preferred stock which was effected on October 16, 2018. The par value of the common stock and redeemable convertible preferred stock were not adjusted as a result of the reverse stock split. Accordingly, all share and per share amounts for all periods presented in the consolidated financial statements and notes thereto have been adjusted retrospectively to reflect this reverse stock split.

Deferred offering costs

Deferred offering costs, which consist of direct incremental legal, consulting, banking and accounting fees relating to the Company's IPO, are capitalized and will be offset against proceeds from the IPO within stockholders' equity. As of September 30, 2018, there was $3.7 million of deferred offering costs within other non-current assets on the condensed consolidated balance sheets. During the three months ended December 31, 2018, an additional $1.6 million in deferred offering costs were incurred. In connection with the IPO, as of December 31, 2018, all deferred offering costs were charged against the proceeds from the IPO.

Recent accounting pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) 2014-09, *Revenue from Contracts with Customers (Topic 606)*, which provides accounting guidance for all revenue arising from contracts with customers, and supersedes most current revenue recognition guidance. The core principle of the new standard is that a company should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. The two permitted transition methods under the new standard are the full retrospective method, in which case the standard would be applied to each prior reporting period presented and the cumulative effect of applying the standard would be recognized at the earliest period shown, or the modified retrospective method, in which case the cumulative effect of applying the standard would be recognized at the date of initial application. The Company adopted the new revenue standard, on October 1, 2017, using the full retrospective method.

In February 2016, the FASB issued new lease accounting guidance in ASU 2016-02, *Leases*. Under the new guidance, lessees will be required to recognize for all leases (with the exception of short-term leases) at the commencement date: (1) a lease liability, which is a lessee's obligation to make lease payments arising from a lease, measured on a discounted basis; and (2) a right-of-use asset, which is an asset that represents the lessee's right to use, or control the use of, a specified asset for the lease term. The new lease guidance is effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. Early application is permitted. The Company is currently evaluating the impact that the adoption of this standard will have on its 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*, which was intended to reduce diversity in practice in how certain cash receipts and payments are presented and classified in the statement of cash flows. The standard provides guidance in a number of situations including, among others, settlement of zero-coupon bonds, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, and distributions received from equity method investees. The ASU also provides guidance for classifying cash receipts and payments that have aspects of more than one class of cash flows. The Company adopted this standard effective October 1, 2018. The adoption of ASU 2016-15 did not have an impact on the Company's condensed consolidated financial statements for either period presented.

In November 2016, the FASB has issued ASU 2016-18, *Statement of Cash Flows (Topic 230): Restricted Cash*. This ASU applies to all entities that have restricted cash and are required to present a statement of cash flows. The ASU requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash. As a result, amounts generally described as restricted cash should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. Further, a reconciliation between the balance sheet and statement of cash flows is required when the balance sheet includes more than one line item for cash, cash equivalents and restricted cash. Therefore, transfers between these balances should no longer be presented as a cash flow activity. The Company adopted this standard effective October 1, 2018 utilizing the retrospective transition method to each period presented. The following table provides a reconciliation of the Company's cash and cash equivalents, current portion of restricted cash and non-current portion of restricted cash reported within the condensed consolidated balance sheets that sum to the total cash, cash equivalents and restricted cash shown in the Company's condensed consolidated statements of cash flows for the periods presented:

(in thousands)	September 30, 2018	December 31, 2018
Cash and cash equivalents	$ 80,757	$ 66,459
Restricted cash, non-current	579	579
Restricted cash, current (within prepaid expenses and other current assets)	201	57
Total cash, cash equivalents and restricted cash	$ 81,537	$ 67,095

Amounts included in restricted cash primarily relate to security deposits and a letter of credit with a financial institution, both in connection with office space lease agreements.

In January 2017, the FASB has issued ASU 2017-01, *Business Combinations (Topic 805)*: *Clarifying the Definition of a Business*, clarifying the definition of a business. The ASU affects all companies and other reporting organizations that must determine whether they have acquired or sold a business. The definition of a business affects many areas of accounting including acquisitions, disposals, goodwill, and consolidation. The Company adopted this standard effective October 1, 2018. The Company will apply the provisions of this ASU in evaluating the definition of a business for any prospective transaction from October 1, 2018.

In January 2017, the FASB issued ASU 2017-04, *Intangibles — Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment.* This ASU simplifies the subsequent measurement of goodwill. The ASU eliminates step 2 from the goodwill impairment test, including for reporting units with a zero or negative carrying amount that fail a qualitative test. An entity still has the option to perform the qualitative assessment for a reporting unit to determine if the quantitative impairment test is necessary. This ASU should be applied on a prospective basis. This ASU is effective for annual or any interim goodwill impairment tests in fiscal years beginning after December 15, 2019. Early adoption is permitted for interim or annual goodwill impairment tests performed on testing dates after January 1, 2017. The Company has not yet determined whether it will early adopt this ASU.

In May 2017, the FASB issued ASU 2017-09, *Compensation — Stock Compensation (Topic 718): Scope of Modification Accounting*, which clarifies when to account for a change to the terms or conditions of a stock-based payment award as a modification. Under ASU 2017-09, modification accounting is required only if the fair value, the vesting conditions, or the classification of the award (as equity or liability) changes as a result of the change in terms or conditions. This standard is effective for all entities for annual reporting periods beginning after December 15, 2017, including interim periods within that reporting period. The Company adopted this standard effective October 1, 2018. The adoption of ASU 2017-09 did not have an impact on the Company's condensed consolidated financial statements for either period presented.

In August 2018, the FASB issued ASU 2018-13, *Fair Value Measurement (Subtopic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement*, which modifies the disclosure requirements on fair value measurements. The amendments on changes in unrealized gains and losses, the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements, and the narrative description of measurement uncertainty should be applied prospectively for only the most recent interim or annual period presented in the initial year of adoption. All other amendments should be applied retrospectively to all periods presented upon their effective date. ASU 2018-14 will be effective for the Company for the quarter ending December 31, 2020, with early adoption permitted. The Company is currently assessing the impact of adoption on its disclosures.

3. Fair value measurement

The Company assesses the fair value of financial instruments based on the provisions of ASC 820, Fair Value Measurements. ASC 820 defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. ASC 820 also establishes a fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The standard describes three levels of inputs that may be used to measure fair value:

Level 1—Quoted prices in active markets for identical assets or liabilities.

Level 2—Observable inputs other than Level 1 prices such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. The Company short-term investments primarily utilizes broker quotes in a non-active market for valuation of its short term investments.

Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

In determining fair value, the Company utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible as well as considers counterparty credit risk in its assessment of fair value.

The following tables summarize the Company's financial assets and liabilities measured at fair value on a recurring basis as of September 30, 2018 and December 31, 2018 and indicate the fair value hierarchy of the valuation inputs utilized to determine such fair value.

	September 30, 2018			
(in thousands)	Level 1	Level 2	Level 3	Fair value
Assets				
Cash and cash equivalents	$ 46,823	$ —	$ —	$ 46,823
Money market funds	33,934	—	—	33,934
Totals	$ 80,757	$ —	$ —	$ 80,757
Liabilities				
Redeemable convertible preferred stock warrant liability	$ —	$ —	$ 631	$ 631

	December 31, 2018			
(in thousands)	Level 1	Level 2	Level 3	Fair value
Assets				
Cash and cash equivalents	$ 21,041	$ —	$ —	$ 21,041
Money market funds	39,321	—	—	39,321
Corporate bonds	—	2,993	—	2,993
Commercial paper	—	28,707	—	28,707
U.S. government treasury bills	38,104	—	—	38,104
Totals	$ 98,466	$ 31,700	$ —	$ 130,166

As of September 30, 2018 and December 31, 2018, gross unrealized gains and unrealized losses for cash equivalents and short-term investments were not material, and the contractual maturity of all marketable securities were less than one year.

Redeemable convertible preferred stock warrants

The following table provides a reconciliation of beginning and ending balances of the Level 3 instruments during the three months ended December 31, 2017 and 2018:

	December 31, 2017				
(in thousands)	Series A	Series B	Series C	Series D	Total
Fair value as of September 30, 2017	$ 331	$ 110	$ 152	$ 51	$644
Change in fair value recorded in other income (expense), net	6	5	(12)	(1)	(2)
Fair value as of December 31, 2017	$ 337	$ 115	$ 140	$ 50	$642

	December 31, 2018				
(in thousands)	Series A	Series B	Series C	Series D	Total
Fair value as of September 30, 2018	$ 365	$ 94	$ 130	$ 42	$ 631
Conversion of redeemable convertible preferred stock warrants to common stock warrants	(365)	(94)	(130)	(42)	(631)
Fair value as of December 31, 2018	$ —	$ —	$ —	$ —	$ —

4. Inventory

Inventory consists of the following:

(in thousands)	September 30, 2018	December 31, 2018
Raw Materials	$ 2,988	$ 3,351
Work-in-process	2,273	1,599
Finished Goods	767	611
	$ 6,028	$ 5,561

5. Goodwill and intangible assets

There were no changes to the carrying value of goodwill during the three months ended December 31, 2017 and 2018. Total amortization expense related to intangible assets was less than $0.1 million for each of the three months ended December 31, 2017 and 2018.

The intangible assets balances are presented below:

	September 30, 2018			
(in thousands, except for years)	Useful life in years	Gross carrying amount	Accumulated amortization	Net book value
Developed Technology	6	$ 1,220	$ (508)	$ 712
Tradenames & Trademarks	2	20	(20)	—
Total indefinite-lived intangible assets		$ 1,240	$ (528)	$ 712

	December 31, 2018			
(in thousands, except for years)	Useful life in years	Gross carrying amount	Accumulated amortization	Net book value
Developed Technology	6	$ 1,220	$ (559)	$ 661
Tradenames & Trademarks	2	20	(20)	—
Total indefinite-lived intangible assets		$ 1,240	$ (579)	$ 661

6. Commitments and contingencies

Litigation

In February 2016, a complaint was filed in the Superior Court of the State of California (County of Santa Clara), dated February 3, 2016 on behalf of Agilent Technologies, Inc. (Agilent), against the Company and its CEO, Ms. Emily Leproust. Agilent's complaint alleges three claims (1) alleged breach of contract, related to the use of confidential information and alleged breach of non-solicitation obligations against Ms. Leproust; (2) alleged breach of a duty of loyalty against Ms. Leproust; and (3) alleged misappropriation of trade secrets under the California Uniform Trade Secrets Act (CUTSA) against all defendants. On December 7, 2018, the Court granted Agilent's motion to amend its complaint, permitting Agilent to file its Second Amended Complaint. The Second Amended Complaint, filed December 13, 2018, adds amended allegations against the Company and the CEO, and also new claims for breach of contract and trade secret misappropriation against two individuals: a current Company employee and a former Company employee. The Court also set trial to begin on February 24, 2020.

On January 29, 2019, the Company and Ms. Leproust filed a demurrer and motion to strike Agilent's second amended complaint, challenging each of Agilent's claims. The hearing on the demurrer and motion to strike is currently set for May 3, 2019. Also, on January 29, 2019, the Company and Ms. Leproust filed a cross-complaint, asserting six counterclaims against Agilent and Does 1-10 for (1) declaration of no trade secret misappropriation; (2) declaration of no breach of contract; (3) declaration of no breach of duty of loyalty; (4) defamation, defamation per se, libel, libel per se, slander, and slander per se; (5) intentional interference with prospective economic advantage; (6) unlawful and unfair competition. The Company and Ms. Leproust also filed their answer and affirmative defenses to Agilent's second amended complaint. The Company believes that Agilent's complaint is without merit, and intends to continue vigorously defending itself. The Company is currently unable to predict the ultimate outcome of this matter or estimate a reasonably possible loss or range of loss, and no amounts have been accrued in the condensed consolidated financial statements.

Indemnifications

In the ordinary course of business, the Company enters into agreements that may include indemnification provisions. Pursuant to such agreements, the Company may indemnify, hold harmless and defend the indemnified parties for losses suffered or incurred by the indemnified party. Some of the provisions will limit losses to those arising from third-party actions. In some cases, the indemnification will continue after the termination of the agreement. The maximum potential amount of future payments the Company could be required to make under these provisions is not determinable. To date, the Company has not incurred material costs to defend lawsuits or settle claims related to these indemnification provisions. The Company has also entered into indemnification agreements with its directors and officers that may require it to indemnify its directors and officers against liabilities that may arise by reason of their status or service as directors or officers to the fullest extent permitted by corporate law. The Company also has directors' and officers' insurance.

7. Related party transactions

During the three months ended December 31, 2017 and 2018, the Company purchased raw materials from a related party investor in the amount of $0.4 million and $1.2 million, respectively. Payable balances and cash receipts and receivable balances with the related party were immaterial as of December 31, 2018.

8. Income taxes

In determining quarterly provisions for income taxes, the Company uses the annual estimated effective tax rate applied to the actual year-to-date profit or loss, adjusted for discrete items arising in that quarter. The Company's annual estimated effective tax rate differs from the U.S. federal statutory rate primarily as a result of state taxes, foreign taxes, and changes in the Company's valuation allowance against its deferred tax assets. For each of the three months ended December 31, 2017 and 2018, the Company recorded provisions for income taxes of less than $0.1 million.

9. Warrants

In connection with its long-term debt agreements, the Company issued warrants for its redeemable convertible preferred stock and common stock as follows:

(in thousands, except share and per share data)	Number of shares underlying warrants	Fair Value			
Warrant class/series:	September 30, 2018		Issuance date	Expiration date	Exercise price per share
Series A	36,838	$ 365	October 8, 2013	October 8, 2023	$ 3.26
Series B	16,221	94	September 2, 2014	September 2, 2024	$ 7.84
Series C	18,854	130	December 22, 2015	December 22, 2025	$ 14.85
Series D	7,531	42	March 28, 2016	March 28, 2026	$ 21.24
Total preferred stock warrants	79,444	$ 631			
Common stock warrants	64,127	$ 486	September 6, 2017	September 6, 2027	$ 6.24

(in thousands, except share and per share data)	Number of shares underlying warrants			
Warrant class/series:	December 31, 2018	Issuance date	Expiration date	Exercise price per share
Common stock warrants	16,221	September 2, 2014	September 2, 2024	$ 7.84
Common stock warrants	18,854	December 22, 2015	December 22, 2025	$ 14.85
Common stock warrants	7,531	March 28, 2016	March 28, 2026	$ 21.24
Common stock warrants	32,064	September 6, 2017	September 6, 2027	$ 6.24
Total common stock warrants	74,670			

In October 2018, each warrant to purchase redeemable convertible preferred stock was converted to a warrant to purchase common stock immediately prior to the completion of the IPO. In November 2018, a total of 68,901 warrants were net exercised; 36,838 warrants with an exercise price of $3.26 per common share and 32,063 warrants with an exercise price of $6.24 per common share. The transactions were a cashless exercise for a net 57,122 of common shares issued by the Company.

10. Redeemable convertible preferred stock

In October 2018, each share of Series A, Series B, Series C and Series D redeemable convertible preferred stock was converted into common stock immediately prior to the completion of the IPO.

11. Stock-based compensation

2018 Equity Incentive Plan

On September 26, 2018, the board of directors adopted the 2018 Equity Incentive Plan (the 2018 Plan) as a successor to the 2013 Stock Plan (the 2013 Plan). The maximum aggregate number of shares that may be issued under the 2018 Plan is 5,856,505 shares of the Company's common stock. The number of shares reserved for issuance under the 2018 Plan will be increased automatically on the first day of each fiscal year, following the fiscal year in which the 2018 Plan became effective, by a number equal to the least of 999,900 shares, 4% of the shares of common stock outstanding at that time, or such number of shares determined by the Company's board of directors. The common shares issuable under the 2018 Plan were registered pursuant to a registration statement on Form S-8 on November 1, 2018.

Any shares subject to outstanding awards under the 2013 Equity Incentive Plan that are cancelled or repurchased subsequent to the 2018 Plan's effective date are returned to the pool of shares reserved for issuance under the 2018 Plan. Awards granted under the 2018 Plan may be nonstatutory stock options, stock appreciation rights, restricted stock, restricted stock units, performance shares and performance units.

2018 Employee Stock Purchase Plan

On September 26, 2018, the board of directors adopted the 2018 Employee Stock Purchase Plan (the 2018 ESPP). A total of 275,225 shares of the Company's common stock have been reserved for issuance under the 2018 ESPP. The number of shares reserved for issuance under the 2018 ESPP will be increased automatically on the first day of each fiscal year, following the fiscal year in which the 2018 ESPP becomes effective, by a number equal to the least of 249,470 shares, 1% of the shares of common stock outstanding at that time, or such number of shares determined by the Company's board of directors. Subject to any plan limitations, the 2018 ESPP allows eligible service providers (through qualified and non-qualified offerings) to contribute, normally through payroll deductions, up to 15% of their earnings for the purchase of the Company's common stock at a discounted price per share. The offerings periods beginning in February and August of each year, except the initial offering period which commenced with the initial public offering in October 2018 and ends on August 20, 2019. The common shares issuable under the 2018 ESPP were registered pursuant to a registration statement on Form S-8 on November 26, 2018.

Unless otherwise determined by the board of directors, the Company's common stock will be purchased for the accounts of employees participating in the 2018 ESPP at a price per share that is the lesser of 85% of the fair market value of the Company's common stock on the first trading day of the offering period, which for the initial offering period is the price at which shares of the Company's common stock were first sold to the public, or 85% of the fair market value of the Company's common stock on the last trading day of the offering period.

Activity under the equity incentive plans during the three months ended December 31, 2018 is summarized below:

	Shares available	Options outstanding	Weighted average exercise price per share	Weighted average remaining contractual term	Aggregate intrinsic value
Outstanding at September 30, 2018	860,287	2,520,485	$ 8.22	8.38	$11,482,909
Additional shares authorized	2,494,700	—			
Stock options granted	(1,038,532)	1,038,532	25.46		
Stock options exercised	—	(48,841)	4.67		
Stock options forfeited	10,136	(10,136)	9.52		
Restricted stock units granted	(395,698)	—	—		
Early exercised options repurchased	442	—			
Outstanding at December 31, 2018	1,931,335	3,500,040	13.38	8.63	$37,247,861
Vested or expected to vest and exercisable at December 31, 2018		3,500,040	13.38	8.63	$37,247,861

Total stock-based compensation expense recognized was as follows:

	Three months ended December 31,	
(in thousands)	2017	2018
Cost of revenues	$ 77	$ 251
Research and development	144	300
Selling, general and administrative	315	1,313
Total stock-based compensation	$ 536	$ 1,864

As of December 31, 2018, there was $31.3 million of total unrecognized compensation cost related to non-vested stock options under the equity incentive plans that is expected to be recognized over a weighted average period of 3.75 years.

Restricted Stock Units

Restricted stock primarily consists of restricted stock unit awards (RSUs) which have been granted to employees. The value of an RSU grant is based on the Company's stock price on the date of grant. The shares underlying the RSU awards are not issued until the RSUs vest. Upon vesting, each RSU converts into one share of the Company's common stock. In November 2018, the Company granted 395,698 RSUs to its employees and executive officers under the 2018 Plan of which 390,002 have a service-based vesting condition over a five-year period and 5,696 have a service-based vesting condition over a four-year period. The RSUs have a weighted average grant date fair value of $26.66. As of December 31, 2018, there was $10.4 million of total unrecognized compensation cost related to this issuance that is expected to be recognized over a weighted-average period of 4.9 years.

12. Net loss per share attributable to common stockholders

The following table sets forth the computation of the Company's basic and diluted net loss per share attributable to common stockholders:

(in thousands, except share and per share data)	Three months ended December 31, 2017	2018
Numerator:		
Net loss attributable to common stockholders	$ (16,937)	$ (22,639)
Denominator:		
Weighted average shares used in computing net loss per share, basic and diluted	2,638,068	19,187,533
Net loss per share attributable to common stockholders, basic and diluted	$ (6.42)	$ (1.18)

The potentially dilutive common shares that were excluded from the calculation of diluted net loss per share because their effect would have been antidilutive for the periods presented are as follows:

(in thousands, except share and per share data)	Three months ended December 31, 2017	2018
Shares subject to options to purchase common stock	1,894,028	3,500,040
Unvested restricted shares of common stock	493,756	81,473
Unvested restricted shares units of common stock	—	395,698
Unvested shares of common stock issued upon early exercise of stock options	64,640	59,548
Shares subject to warrants to purchase common stock	64,127	74,670
Shares subject to warrants to purchase redeemable convertible preferred stock	79,444	—
Shares of redeemable convertible preferred stock	15,091,496	—
Total	17,687,491	4,111,429

13. Geographic, product and industry information

The table below sets forth revenues by geographic region, based on ship-to destinations. North America consists of Canada and Mexico; EMEA consists of Europe, Middle East, and Africa; and APAC consists of Japan, China, South Korea, Singapore, Malaysia and Australia.

(in thousands)	Three months ended December 31, 2017	2018
United States	$ 3,010	$ 8,569
EMEA	1,102	2,435
APAC	151	420
North America	50	68
Total	$ 4,313	$ 11,492

The table below sets forth revenues by products.

(in thousands)	Three months ended December 31, 2017	2018
Synthetic genes	$ 3,116	$ 6,511
Oligo pools	728	810
DNA libraries	308	413
NGS tools	161	3,758
Total	$ 4,313	$11,492

The table below sets forth revenues by industry.

(in thousands)	Three months ended December 31, 2017	2018
Industrial chemicals	$2,678	$ 5,346
Academic research	964	1,972
Healthcare	568	3,981
Agricultural	103	193
Total	$4,313	$11,492

Long-lived assets located in the United States were $13.1 million as of December 31, 2018. Long-lived assets located outside of the United States were $0.5 million as of December 31, 2018.

* * * * *

Item 2. ***Management's discussion and analysis of financial condition and results of operations***

You should read the following discussion and analysis of our financial condition and results of operations together with the condensed consolidated financial statements and related notes that are included elsewhere in this Quarterly Report on Form 10-Q and our Annual Report on Form 10-K for the fiscal year ended September 30, 2018 filed with the U.S. Securities and Exchange Commission, or the SEC, on December 20, 2018, or Annual Report on Form 10-K. This discussion contains forward-looking statements based upon current plans, expectations and beliefs that involve risks and uncertainties. Our actual results may differ materially from those anticipated in these forward-looking statements as a result of various factors, including, but not limited to, those discussed in the section entitled "Risk Factors" and elsewhere in this Quarterly Report on Form 10-Q. In preparing this MD&A, we presume that readers have access to and have read the MD&A in our Annual Report on Form 10-K, pursuant to Instruction 2 to paragraph (b) of Item 303 of Regulation S-K.

Overview

We are a leading and rapidly growing synthetic biology company that has developed a disruptive DNA synthesis platform to industrialize the engineering of biology. The core of our platform is a proprietary technology that pioneers a new method of manufacturing synthetic DNA by "writing" DNA on a silicon chip. We have combined this technology with proprietary software, scalable commercial infrastructure and an e-commerce platform to create an integrated technology platform that enables us to achieve high levels of quality, precision, automation, and manufacturing throughput at a significantly lower cost than our competitors. We are leveraging our unique technology to manufacture a broad range of synthetic DNA-based products, including synthetic genes, tools for next generation sample preparation, and antibody libraries for drug discovery and development. Additionally, we believe our platform will enable new value-add opportunities, such as discovery partnerships for biologic drugs, and will enable new applications for synthetic DNA, such as digital data storage. We sell our synthetic DNA and synthetic DNA-based products to a customer base of over 700 customers across a broad range of industries. We launched the first application of our platform, synthetic genes and oligo pools, in April 2016 to disrupt the gene synthesis market and make legacy DNA synthesis methods obsolete.

We have also leveraged the versatility of our platform to expand our product portfolio into other markets in which we believe we have a competitive advantage. In February 2018, we launched an innovative and comprehensive preparation kit for next generation sequencing at the Advances in Genome Biology and Technology conference. Our kit leverages our platform to precisely synthesize oligo pools and uniformly amplify the desired target DNA segments, considerably improving the accuracy of the downstream sequencing analysis. We have also commercialized a custom DNA library solution which enables more effective biologic drug discovery and development for our customers. We believe we can further leverage our platform to develop other proprietary tools, such as our GPCR library and antibody optimization solution, to provide an end-to-end solution in biologics drug discovery and early development, from target to Investigational New Drug (IND) application, adding value as a partner to biotech and pharmaceutical companies. We also aim to explore development of DNA as a digital data storage medium via internal research and industry partnerships.

We have built a scalable commercial platform that enables us to reach a diverse customer base that we believe includes over 100,000 synthetic DNA users today. In order to address this diverse customer base, we have employed a multi-channel strategy comprised of a direct sales force targeting synthetic DNA customers, a direct sales force focusing on the NGS market, international distributors and an e-commerce platform. We launched our proprietary, innovative, and easy-to-use e-commerce platform in October 2017 to existing customers and expanded access to the general public in January 2018. Our platform allows customers to design, validate, and place on-demand orders of customized DNA online. This is a key component of our strategy to address and support our diverse and growing customer base, as well as support commercial productivity, enhance the customer experience, and promote loyalty.

On October 30, 2018, our registration statement on Form S-1 was declared effective by the SEC and our shares began trading on the NASDAQ Global Stock Market on October 31, 2018. A total of 5,750,000 shares were offered and sold at a price of $14.00 per share. As a result of the initial public offering, or IPO, the Company received $69.6 million in net proceeds, after deducting underwriting discounts and commissions of $5.6 million and offering expenses of approximately $5.3 million payable by the Company.

In the quarter ended December 31, 2018 our net revenues increased sequentially to $11.5 million from $8.4 million in the prior quarter; an increase of 37%. Our net revenues from NGS tools grew to $3.8 million in the first quarter of 2019, from $0.9 million in the fourth quarter of 2018, due to early adopters beginning to ramp up production volumes. Our gene revenue attributable to Ginkgo Bioworks, our largest customer, was $2.7 million in the first quarter of 2019, versus $3.2 million in fourth quarter of 2018. Our non-Ginkgo gene revenue increased to $3.8 million revenue in the first quarter of 2019 versus $2.9 million in the prior quarter for sequential growth of 30%. Our selling, general and administrative, or SG&A expenses increased to $15.3 million from $13.0 million in the prior quarter due to increases in salary and compensation, as we expanded our infrastructure, costs related to the IPO, and continued commercialization of our products. Our R&D expenses increased from $6.1 million in fourth quarter 2018 to $7.3 million in the current quarter driven primarily by increased salary and compensation as we continue to build out our R&D capabilities as well as consumable materials.

As of September 30, 2018 and December 31, 2018, we had $80.8 million and $130.2 million in cash, cash equivalents and short term investments, respectively.

Financial overview

The following table summarizes certain selected historical financial results:

(in thousands)	Three months ended December 31, 2017	2018
Revenues	$ 4,313	$ 11,492
Loss from operations	(16,751)	(22,897)
Net loss attributable to common stockholders	(16,937)	(22,639)

Revenues

We generate revenue from sales of synthetic genes, oligo pools, next generation sequencing tools and DNA libraries. We recognize revenue upon delivery to our customers and bill them directly for the shipments. Our ability to increase our revenues will depend on our ability to further penetrate the domestic and international markets, generate sales through our direct sales force, and over time from our e-commerce platform.

Revenues by geography

We have one reportable segment from the sale of synthetic DNA products. The following table shows our revenues by geography, based on our customers' shipping addresses. North America consists of Canada and Mexico; EMEA consists of Europe, Middle East, and Africa; and APAC consists of Japan, China, South Korea, Singapore, Malaysia and Australia.

(in thousands, except percentages)	Three months ended December 31, 2017	%	2018	%
United States	$3,010	70%	$ 8,569	74%
EMEA	1,102	25%	2,435	21%
APAC	151	4%	420	4%
North America	50	1%	68	1%
Total revenues	$4,313	100%	$11,492	100%

Revenues by products

The table below sets forth revenues by products:

(in thousands, except percentages)	Three months ended December 31, 2017	%	2018	%
Synthetic genes	$3,116	72%	$ 6,511	56%
Oligo pools	728	17%	810	7%
DNA libraries	308	7%	413	4%
NGS tools	161	4%	3,758	33%
Total revenues	$4,313	100%	$11,492	100%

Revenues by industry

The table below sets forth revenues by industry:

(in thousands, except percentages)	Three months ended December 31, 2017	%	2018	%
Industrial chemicals	$2,678	62%	5,346	46%
Academic research	964	23%	1,972	17%
Healthcare	568	13%	3,981	35%
Agriculture	103	2%	193	2%
Total revenues	$4,313	100%	$11,492	100%

Gene shipments

Shipments and number of genes shipped in the three months ended December 31, 2016, March 31, 2017, June 30, 2017, September 30, 2017, December 31, 2017, March 31, 2018, June 30, 2018, September 30, 2018 and December 31, 2018 were as follows:

	Three months ended								
(in thousands, except shipments)	December 31, 2016	March 31, 2017	June 30, 2017	September 30, 2017	December 31, 2017	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
Number of genes shipped	18,210	31,019	38,210	38,023	44,784	71,246	60,252	70,820	71,246
Number of shipments	137	292	569	751	964	1,251	1,694	2,229	2,943

Comparison of the three months ended December 31, 2017 and 2018

Revenues

	Three months ended December 31,			
(in thousands, except percentages)	2017	2018	Change	%
Revenues	$4,313	$11,492	$7,179	166%

Revenues increased from $4.3 million to $11.5 million in the three months ended December 31, 2018, which was an increase of $7.2 million, or 166%, over the three months ended December 31, 2017. The revenue increase was primarily driven by increases in synthetic genes revenue of $3.4 million and NGS tools revenue of $3.6 million. The primary increase in synthetic genes revenue is due to volume increases of genes shipped to customers period-over-period, driven by increased investment in our sales force infrastructure, international expansion and the launching of the e-commerce platform in fiscal 2018. In the three months ended December 31, 2018, we shipped 71,246 genes compared to 44,784 genes in the three months ended December 31, 2017, an increase of 59%. Gene pricing to our customers was relatively constant period-over-period. The primary reasons for NGS tools revenue growth period-over-period was attributed to increased investment in our sales force infrastructure and as more customers commercially adopt our NGS tools the volume of units shipped increased as our customers migrate from pilot to commercial volumes. We do not believe the pricing had a meaningful impact on the revenue changes for NGS tools period-over-period.

Cost of revenues

	Three months ended December 31,			
(in thousands, except percentages)	2017	2018	Change	%
Cost of revenues	$7,498	$11,857	$4,359	58%

In the three months ended December 31, 2018, cost of revenue increased to $11.9 million from $7.5 million from the three months ended December 31, 2017. The increase was primarily due to payroll and stock compensation related expense increase of $1.5 million due to an increase in headcount, increased consumption of reagents and production materials of $2.3 million, information technology and facilities cost increase of $0.6 million, $0.1 million increase in depreciation expense related to additional equipment for increased production capacity, and increased maintenance costs of $0.1 million. These expenses were partially offset by a decrease in subcontracting services of $0.1 million related to utilizing more fulltime employees.

Research and development expenses

	Three months ended December 31,			
(in thousands, except percentages)	2017	2018	Change	%
Research and development	$4,303	$7,273	$2,970	69%

In the three months ended December 31, 2018, research and development expenses increased to $7.3 million from $4.3 million in the three months ended December 31, 2017. The increase was driven primarily due to increased payroll and stock compensation related expense of $1.6 million as a result of expanding R&D capabilities and our platform for pharmaceutical biologics drug discovery. Subcontracting services costs increased by $0.2 million and outside services costs increased by $0.1 million to support software and product development. As we increased R&D efforts our consumption of reagents and production materials increased by $0.3 million, lab equipment costs increased by $0.2 million, as well as other increases of $0.4 million.

Selling, general and administrative expenses

(in thousands, except percentages)	Three months ended December 31, 2017	2018	Change	%
Selling, general and administrative	$9,263	$15,259	$5,996	65%

In the three months ended December 31, 2018, selling, general and administrative expenses increased to $15.3 million from $9.3 million in the three months ended December 31, 2017, primarily due to increases in payroll expenses related to increased headcount, advertising and marketing expenses, professional and legal expenses, stock compensation expenses and information technology related charges. Salaries and related costs increased by $3.6 million, as we expanded our commercial team. In addition, professional services expenses increased by $1.0 million due to commercial expansion of our products and setting up our infrastructure to become a public company. Our marketing related activities increased $0.6 million and remaining increases all relate to commercialization of sales group or corporate development towards preparation of going public.

Interest, and other income (expense), net

(in thousands, except percentages)	Three months ended December 31, 2017	2018	Change	%
Interest income	$ 158	$ 664	$ 506	320%
Interest expense	(273)	(348)	(75)	(27)%
Other income (expense)	(19)	(15)	4	21%
Total interest, and other income (expense), net	$(134)	$ 301	$ 435	325%

Interest income was $0.2 million in the three months ended December 31, 2017 and $0.7 million in the three months ended December 31, 2018, resulting from our short-term investments. Interest expense was $0.3 million in the three months ended December 31, 2017 and 2018 related to our outstanding debt.

Provision for income taxes

(in thousands, except percentages)	Three months ended December 31, 2017	2018	Change	%
Provision for income taxes	$ 52	$ 43	$ 9	17%

We recorded $0.1 million in the three months ended December 31, 2017 and 2018.

Liquidity and capital resources

As of December 31, 2018, our principal sources of liquidity were $130.2 million of cash and cash equivalents and marketable securities, which primarily consist of short-term, investment-grade commercial paper, corporate bonds, and U.S. government treasury bills. We believe our existing cash and cash equivalents, investments in marketable securities and cash from operations will be sufficient to meet our working capital needs, capital expenditures and financing obligations for at least the next 12 months.

Our future capital requirements will depend on many factors, including our growth rate, the expansion of our direct sales force, strategic relationships and international operations, the timing and extent of spending to support research and development efforts and the continuing market acceptance of our solutions. We may require additional equity or debt financing. Sales of additional equity could result in dilution to our stockholders. If we raise funds by borrowing from third parties, the terms of those financing arrangements would require us to incur interest expense and may include negative covenants or other restrictions on our business that could impair our operating flexibility. We can provide no assurance that financing will be available at all or, if available, that we could be able to obtain financing on terms favorable to us. If we are unable to raise additional capital when needed, we would be required to curtail our operating activities and capital expenditures, and our business operating results and financial condition would be adversely affected.

Operating capital requirements

Our primary uses of capital are, and we expect will continue to be for the near future, compensation and related expenses, manufacturing costs, laboratory and related supplies, legal and other regulatory expenses and general overhead costs. As of December 31, 2018, we had $2.4 million in commitments for capital expenditures.

Cash flows

The following table summarizes our sources and uses of cash and cash equivalents:

(in thousands)	Three months ended December 31, 2017	2018
Net cash used in operating activities	$ (16,016)	$ (21,684)
Net cash provided by (used in) investing activities	8,215	(65,757)
Net cash provided by financing activities	2,662	72,999
Net increase (decrease) in cash and cash equivalents	$ (5,139)	$ (14,442)

Operating activities

Net cash used in operating activities was $16.0 million in the three months ended December 31, 2017, and consisted primarily of a net loss of $16.9 million adjusted for non-cash items including depreciation and amortization expenses of $1.4 million, stock-based compensation expense of $0.5 million, and a change in operating assets and liabilities of approximately $1.0 million.

Net cash used in operating activities was $21.7 million in the three months ended December 31, 2018, and consisted primarily of a net loss of $22.6 million adjusted for non-cash items including depreciation and amortization expenses of $1.6 million, stock-based compensation expense of $1.9 million, a change in operating assets and liabilities of approximately $2.6 million.

Investing activities

In the three months ended December 31, 2017, our investing activities provided net cash of approximately $8.2 million. Investing activities included the purchases and maturity of investments and purchases of laboratory property, equipment and computers.

In the three months ended December 31, 2018, our investing activities used net cash of approximately $65.8 million. The use of net cash resulted primarily from the net impact of purchases and maturity of investments, and purchases of laboratory property, equipment and computers.

Financing activities

Net cash provided by financing activities was $2.7 million in the three months ended December 31, 2017, which consisted of $3.0 million from the issuance of redeemable convertible preferred stock, $0.1 million from the issuance of common stock, off-set by the payment of $0.5 million of deferred offering costs.

Net cash provided by financing activities was $73.0 million in the three months ended December 31, 2018, which consisted of $72.8 million in proceeds from initial public offering, net of underwriting discounts, commissions and offering expenses, and $0.2 million from the issuance of common stock and exercise of stock options.

Off-balance sheet arrangements

We do not have any off-balance sheet arrangements.

Contractual obligations and other commitments

In September 2016, we entered into a collaboration agreement with Distributed Bio to offer therapeutic antibody design and optimization services, as well as an exclusive library targeting G-protein coupled receptors to our customers. Upon successful commercialization, we agreed on a profit-sharing and license arrangement for an Antibody Optimization Software and GPCR-Targeting Antibody Library, which includes royalty payments for discovered pharmaceutical products in a tiered structure, which ranges from 25% to 35% of net revenue generated.

In March 2018, we entered into a stock purchase agreement related to the sale of additional shares of our Series D redeemable convertible preferred stock for the amount of $70.0 million. Pursuant to a side letter to the stock purchase agreement, we have committed, subject to certain conditions, to using commercially reasonable efforts to invest up to $5.0 million, $10.0 million and $10.0 million over a three year period in connection with the incorporation, business and/or operations of a wholly owned foreign enterprise in the People’s Republic of China (PRC).

Critical accounting policies and significant management estimates

Our condensed consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States. The preparation of these condensed consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenue, costs and expenses, and related disclosures. On an ongoing basis, we evaluate our estimates and assumptions. Changes in these estimates and assumptions or conditions could significantly affect our financial condition and results of operations.

During the three months ended December 31, 2018, there were no significant changes to our critical accounting policies and estimates from those previously reported and disclosed in our Annual Report on Form 10-K. “Management’s Discussion and Analysis of Financial Condition and Results of Operations” contained in our Annual Report on Form 10-K filed with the SEC on December 20, 2018 provides a more complete discussion of our critical accounting policies and estimates.

Recently issued accounting pronouncements

For a description of accounting changes and recent accounting pronouncements, including the expected dates of adoption and estimated effects, if any, on our condensed consolidated financial statements, see Note 2, “Summary of Significant Accounting Policies” in Item 1 of Part I of this Quarterly Report on Form 10-Q for a full description of the recent accounting pronouncements and our expectation of their impact, if any, on our results of operations and financial condition.

Item 3. ***Quantitative and qualitative disclosures about market risk***

Interest rates risk

We had cash and cash equivalents totaling $80.8 million and $66.5 million as of September 30, 2018 and December 31, 2018, respectively. We had no short-term investments as of September 30, 2018 and $63.7 million as of December 31, 2018. Our cash and cash equivalents consist of cash in bank accounts and money market funds, and short-term investments consist of U.S. government agency bonds, corporate bonds, and commercial paper. The primary objectives of our investment activities are to preserve principal and provide liquidity without significantly increasing risk. We do not enter into investments for trading or speculative purposes. Due to the relatively short-term nature of our investment portfolio, a hypothetical 100 basis point change in interest rates would not have a material effect on the fair value of our portfolio. We therefore do not expect our operating results or cash flows to be materially affected by a sudden change in market interest rates.

Foreign currency exchange rate risk

Substantially all of our revenues and operating expenses are denominated in U.S. dollars. Therefore, as of December 31, 2018, we do not believe that our exposure to foreign currency exchange risk is material to our business, financial condition or results of operations. However, we expect an increasing portion of our future revenues to be denominated in currencies other than the U.S. Dollar. If a significant portion of our revenue or operating expenses were to become denominated in currencies other than U.S. dollars, we may not be able to effectively manage this risk, and our business, financial condition and results of operations could be adversely affected by translation to U.S. dollars and by transactional foreign currency conversions.

Item 4. ***Controls and procedures***

(a) Evaluation of disclosure controls and procedures

Our management, with the participation of our chief executive officer and our chief financial officer, has evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2018 as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, as of the end of the period covered by the Quarterly Report on Form 10-Q. Based on the evaluation of our disclosure controls and procedures as of December 31, 2018, our chief executive officer and chief financial officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

(b) Changes in internal control over financial reporting

There were no changes in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

(c) ***Inherent Limitations on Effectiveness of Controls***

Our management, including our chief executive officer and our chief financial officer, do not expect that our disclosure controls or our internal control over financial reporting will prevent all errors and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their cost. Because of the inherent limitations in all control systems, no evaluation of control can provide absolute assurance that all issues and instances of fraud, if any, have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of a simple error or mistake. Additionally, controls can be circumvented by individual acts of some persons, by collusion of two or more people or by management override of the controls. The design of any system of controls is also based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions; over time, controls may become inadequate because of changes in conditions, or the degree of compliance with policies or procedures may deteriorate. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

PART II. Other information

Item 1. ***Legal proceedings***

On February 3, 2016 Agilent filed a lawsuit against us and our Chief Executive Officer, Ms. Emily Leproust, in the Superior Court of California, Santa Clara County, or the Court. The complaint also names Does 1 through 20, which are fictitious placeholder defendants. As discussed below in more detail, after the Court granted Agilent leave to do so, Agilent filed a second amended complaint on December 13, 2018, which included adding two individuals as defendants, and Agilent may seek to amend its complaint to name additional defendants in the future. Agilent's complaint alleges three claims against Twist and Ms. Leproust: (1) alleged breach of contract, related to the use of confidential information and alleged breach of non-solicitation obligations against Ms. Leproust; (2) alleged breach of a duty of loyalty against Ms. Leproust; and (3) alleged misappropriation of trade secrets under the California Uniform Trade Secrets Act, or CUTSA, against all defendants.

On August 22, 2018, Agilent filed a motion for leave to amend its complaint, including to add two individuals as defendants. On September 12, 2018, Agilent filed a supplemental declaration in support of its motion to amend, which attached a new, proposed Second Amended Complaint that revised certain allegations in paragraph 2 of the document. On September 28, 2018, Agilent filed a motion for protective order seeking to impose limits on the defendants' discovery in the case. The defendants opposed both motions.

On December 7, 2018, the Court granted Agilent's motion to amend its complaint, permitting Agilent to file its Second Amended Complaint. This new complaint, filed on December 13, 2018, adds amended allegations against us and Ms. Leproust, and also new claims for breach of contract and trade secret misappropriation against two individuals, Dr. Siyuan Chen, a current employee and Ms. Solange Glaize, a former employee. However, the Court denied Agilent's motion for a protective order, and did not set any limits on discovery.

Also, on December 7, 2018, the Court held a case management conference, and set trial to start on February 24, 2020.

Agilent's specific allegations against Twist and Ms. Leproust are set forth in its second amended complaint, which maintains the same set of claims against Twist and Ms. Leproust as the superseded first amended complaint. With regard to the misappropriation claim, Agilent alleges, among other things, that Twist and Ms. Leproust misappropriated trade secrets relating to Agilent's oligonucleotide synthesis technology and used those secrets to develop Twist's technology and identify personnel to hire from Agilent. With regard to the breach of loyalty claim, Agilent alleges, among other things, that Ms. Leproust improperly withheld strategic business and technological plans from Agilent and diverted those plans to Twist instead. With regard to the breach of contract claim, Agilent alleges, among other things, that Ms. Leproust violated her contractual obligations under her employment agreement with Agilent, including by failing to disclose the aforementioned plans and by soliciting one or more Agilent employees to terminate their employment within two years of her resignation.

Agilent's requested relief in its second amended complaint includes: compensatory damages; injunctive relief; punitive and/or statutory exemplary damages; a constructive trust upon allegedly misappropriated assets and gains derived from alleged breaches of agreements; and its attorneys' fees and costs.

On January 29, 2019, Twist and Ms. Leproust filed a demurrer and motion to strike Agilent's second amended complaint, challenging each of Agilent's claims. First, Defendants assert that Agilent's breach of contract claim is antithetical to California law and public policy favoring employee mobility. Second, Defendants assert that California precedent requires that Agilent's duty of loyalty claim be dismissed. Third, Defendants assert that Agilent's trade secret misappropriation claims must be dismissed for failure to identify any harm. The hearing on the demurrer and motion to strike is currently set for May 3, 2019.

That same day, Twist and Leproust filed a cross-complaint, asserting six counterclaims against Agilent and Does 1-10 for (1) declaration of no trade secret misappropriation; (2) declaration of no breach of contract; (3) declaration of no breach of duty of loyalty; (4) defamation, defamation per se, libel, libel per se, slander, and slander per se; (5) intentional interference with prospective economic advantage; (6) unlawful and unfair competition. Twist Bioscience and Ms. Leproust also filed their answer and affirmative defenses to Agilent's second amended complaint. The answer to Agilent's second amended complaint responded to Agilent's allegations and asserted numerous affirmative defenses and furthermore denies Agilent's claims have merit or entitle it to any relief.

We and Ms. Leproust currently believe that we have substantial and meritorious defenses to Agilent's claims and intend to vigorously defend our position and prosecute our counterclaims, including through the trial and appellate stages if necessary. The outcome of any litigation, however, is inherently uncertain and there can be no assurance that the outcome of the case or the costs of litigation, regardless of outcome, will not have a material adverse effect on our business.

We may also be subject to various other legal proceedings and claims arising in the ordinary course of business. Although occasional adverse decisions or settlements may occur, management believes that the final disposition of such matters will not have a material adverse effect on our business, financial position, results of operations or cash flows.

Item 1A. ***Risk factors***

The following discussion of risk factors contains forward-looking statements. These risk factors may be important to understanding other statements in this Quarterly Report Form 10-Q, including "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our unaudited condensed consolidated financial statements and related notes, before making a decision to invest in our common stock. The risks and uncertainties described below are not the only ones we face. Additional risk and uncertainties not presently known to us or that we presently deem less significant may also impair our business operations. If any of the events or circumstances described in the following risk factors actually occurs, our business, operating results, financial condition, cash flows and prospects could be materially and adversely affected. In that event, the market price of our common stock could decline, and you could lose part or all of your investment.

The business, financial condition and operating results of the Company can be affected by a number of factors, whether currently known or unknown, including but not limited to those described below, any one or more of which could, directly or indirectly, cause the Company's actual financial condition and operating results to vary materially from past, or from anticipated future, financial condition and operating results. Any of these factors, in whole or in part, could materially and adversely affect the Company's business, financial condition, operating results and stock price.

Because of the following factors, as well as other factors affecting the Company's financial condition and operating results, past financial performance should not be considered to be a reliable indicator of future performance, and investors should not use historical trends to anticipate results or trends in future periods.

Risks related to our business

We are an early stage company with limited operating history, which may make it difficult to evaluate our current business and predict our future performance.

We were incorporated in February 2013 and began commercial operations in April 2016. Prior to engaging in commercial operations, we focused on research and development of DNA synthesis. Our revenues for the fiscal years ended September 30, 2016, 2017 and 2018 were $2.3 million, $10.8 million and $25.4 million, respectively. We may never achieve commercial success and we have limited historical financial data upon which we may base our projected revenue. We also have limited historical financial data upon which we may base our planned operating expense or upon which you may evaluate our business and our prospects. Based on our limited experience in developing and marketing new products, we may not be able to effectively:

- drive adoption of our products;
- attract and retain customers for our products;
- anticipate and adapt to changes in the existing and emerging markets in which we operate;
- focus our research and development efforts in areas that generate returns on these efforts;
- maintain and develop strategic relationships with suppliers to acquire necessary materials and equipment for the production of our products on appropriate timelines, or at all;
- implement an effective marketing strategy to promote awareness of our products with potential customers;
- scale our manufacturing activities to meet potential demand at a reasonable cost;
- avoid infringement of third-party intellectual property;
- obtain licenses on commercially reasonable terms to third-party intellectual property, as needed;
- obtain valid and enforceable patents that give us a competitive advantage;
- protect our proprietary technology;
- provide appropriate levels of customer training and support for our products; and
- attract, retain and motivate qualified personnel.

In addition, a high percentage of our expenses have been and will continue to be fixed. Accordingly, if we do not generate revenue as and when anticipated, our losses may be greater than expected and our operating results will suffer. You should consider the risks and difficulties frequently encountered by companies like ours in new and rapidly evolving markets when making a decision to invest in our common stock.

We have incurred net losses in every period to date, and we expect to continue to incur significant losses as we develop our business and may never achieve profitability.

We have incurred net losses in each year since inception and have generated limited revenue from product sales to date. We expect to incur increasing costs as we grow our business. We cannot be certain if or when we will produce sufficient revenue from our operations to support our costs. Even if profitability is achieved, we may not be able to sustain profitability. We incurred net losses of $44.1 million, $59.3 million and $71.2 million for the years ended September 30, 2016, 2017 and 2018, respectively. As of December 31, 2018, we had an accumulated deficit of $233.5 million. We expect to incur substantial losses and negative cash flow for the foreseeable future. In addition, as a public company, we will incur significant legal, accounting, and other expenses that we did not incur as a private company. These increased expenses will make it harder for us to achieve and sustain future profitability. We may incur significant losses in the future for a number of reasons, many of which are beyond our control, including the other risks described in this Form 10-Q, the market acceptance of our products, future product development and our market penetration and margins.

We will require additional financing to achieve our goals, and a failure to obtain this necessary capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our product manufacturing and development and other operations.

Since our inception, substantially all of our resources have been dedicated to the development of our DNA synthesis platform. We believe that we will continue to expend substantial resources for the foreseeable future as we expand into additional markets we may choose to pursue. These expenditures are expected to include costs associated with research and development, manufacturing and supply as well as marketing and selling existing and new products. In addition, other unanticipated costs may arise.

We expect that our existing cash and cash equivalents will be sufficient to fund our planned operating expenses, capital expenditure requirements and debt service payments through at least the next 12 months. However, our operating plan may change as a result of factors currently unknown to us, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings or other sources, such as strategic collaborations. Such financing may result in dilution to stockholders, imposition of debt covenants and repayment obligations, or other restrictions that may adversely affect our business. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans.

Our future capital requirements depend on many factors, including:

- the number and characteristics of any additional products or manufacturing processes we develop or acquire to serve new or existing markets;
- the scope, progress, results and costs of researching and developing future products or improvements to existing products or manufacturing processes;
- the cost of manufacturing our DNA synthesis equipment and tools and any future products we successfully commercialize;
- our ability to establish and maintain strategic collaborations, licensing or other arrangements and the financial terms of such agreements;
- the costs of expanding our sales and marketing capabilities in the U.S. and in other geographies, including China;
- any lawsuits related to our products or commenced against us, including the costs associated with our current litigation with Agilent;
- the expenses needed to attract and retain skilled personnel; the costs associated with being a public company;
- the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing patent claims, including litigation costs and the outcome of such litigation; and
- the timing, receipt and amount of sales of, or royalties on, any future approved products, if any.

Additional funds may not be available when we need them, on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, we may be required to:

- delay, limit, reduce or terminate our manufacturing, research and development activities; or
- delay, limit, reduce or terminate our establishment of sales and marketing capabilities or other activities that may be necessary to generate revenue and achieve profitability.

If we are unable to maintain adequate revenue growth or do not successfully manage such growth, our business and growth prospects will be harmed.

We have experienced significant revenue growth in a short period of time. We may not achieve similar growth rates in future periods. Investors should not rely on our operating results for any prior periods as an indication of our future operating performance. To effectively manage our anticipated future growth, we must continue to maintain and enhance our manufacturing, sales, financial and customer support administration systems, processes and controls. Failure to effectively manage our anticipated growth could lead us to over-invest or under-invest in development, operational, and administrative infrastructure; result in weaknesses in our infrastructure, systems, or controls; give rise to operational mistakes, losses, loss of customers, productivity or business opportunities; and result in loss of employees and reduced productivity of remaining employees.

Our continued growth could require significant capital expenditures and might divert financial resources from other projects such as the development of new products and services. As additional products are commercialized, we may need to incorporate new equipment, implement new technology systems, or hire new personnel with different qualifications. Failure to manage this growth or transition could result in turnaround time delays, higher manufacturing costs, declining product quality, deteriorating customer service, and slower responses to competitive challenges. A failure in any one of these areas could make it difficult for us to meet market expectations for our products, and could damage our reputation and the prospects for our business.

If our management is unable to effectively manage our anticipated growth, our expenses may increase more than expected, our revenue could decline or grow more slowly than expected and we may be unable to implement our business strategy. The quality of our products may suffer, which could negatively affect our reputation and harm our ability to retain and attract customers.

The estimates of market opportunity and forecasts of market growth included in this Form 10-Q may prove to be inaccurate, and even if the market in which we compete achieves the forecasted growth, our business could fail to grow at similar rates, if at all.

Market opportunity estimates and growth forecasts are subject to significant uncertainty and are based on assumptions and estimates that may not prove to be accurate. For example, several of the reports rely on discussions with industry thought leaders, employ projections of future applications of synthetic biology and next generation sequencing technology in major end-user market segments and by technology type, and incorporate data from secondary sources such as company websites as well as industry, trade and government publications. The estimates and forecasts in this Form 10-Q relating to the size and expected growth of our market may prove to be inaccurate. Even if the market in which we compete meets the size estimates and growth forecasted in this Form 10-Q, our business could fail to grow at the rate we anticipate, if at all.

Our quarterly and annual operating results and cash flows have fluctuated in the past and might continue to fluctuate, causing the value of our common stock to decline substantially.

Numerous factors, many of which are outside our control, may cause or contribute to significant fluctuations in our quarterly and annual operating results. These fluctuations may make financial planning and forecasting difficult. In addition, these fluctuations may result in unanticipated decreases in our available cash, which could negatively affect our business and prospects. In addition, one or more of such factors may cause our revenue or operating expenses in one period to be disproportionately higher or lower relative to the others. As a result, comparing our operating results on a period-to-period basis might not be meaningful. You should not rely on our past results as indicative of our future performance. Moreover, our stock price might be based on expectations of future performance that are unrealistic or that we might not meet and, if our revenue or operating results fall below the expectations of investors or securities analysts, the price of our common stock could decline substantially.

Our operating results have varied in the past. As a result, our operating results could be unpredictable, particularly on a quarterly basis. In addition to other risk factors listed in this section, some of the important factors that may cause fluctuations in our quarterly and annual operating results are further described in “Risk factors—Risks relating to owning our stock.”

In addition, a significant portion of our operating expense is relatively fixed in nature, and planned expenditures are based in part on expectations regarding future revenue. Accordingly, unexpected revenue shortfalls might decrease our gross margins and could cause significant changes in our operating results from quarter to quarter. If this occurs, the trading price of our common stock could fall substantially.

If we are unable to attract new customers and retain and grow sales from our existing customers, our business will be materially and adversely affected.

In order to grow our business, we must continue to attract new customers and retain and grow sales from our existing customers on a cost-effective basis. To do this, we aim to attract new and existing buyers of synthetic DNA, convert makers of synthetic DNA into buyers of synthetic DNA, and achieve widespread market acceptance by delivering both our current product offerings and new products and technologies at low-cost, with high-quality, reliable turn-around times and throughput, superior e-commerce services and effective technical support. We cannot guarantee that our efforts to provide these key requirements will be consistently acceptable to, and meet the performance expectations of, our customers and potential customers. If we are unable to successfully attract and retain customers, our business, financial position and results of operations would be negatively impacted.

Internet security poses a risk to our e-commerce sales.

We currently generate a small portion of our revenue through sales on our e-commerce platform. However, as part of our growth strategy, we intend to increase the level of customer traffic and volume of customer purchases through our e-commerce platform which we formally launched to the general public in January 2018. We manage our website and e-commerce platform internally and as a result any compromise of our security or misappropriation of proprietary information could have a material adverse effect on our business, financial condition and results of operations. We rely on encryption and authentication technology licensed from third parties to provide the security and authentication necessary to effect secure Internet transmission of confidential information, such as credit and other proprietary information. Advances in computer capabilities, new discoveries in the field of cryptography or other events or developments may result in a compromise or breach of the technology used by us to protect customer transaction data. Anyone who is able to circumvent our security measures could misappropriate proprietary information or cause material interruptions in our operations. We may be required to expend significant capital and other resources to protect against security breaches or to minimize problems caused by security breaches. To the extent that our activities or the activities of others involve the storage and transmission of proprietary information, security breaches could damage our reputation and expose us to a risk of loss and/or litigation. Our security measures may not prevent security breaches. Our failure to prevent these security breaches may result in consumer distrust and may adversely affect our business, results of operations and financial condition.

Our actual operating results may differ significantly from our guidance.

From time to time, we plan to release guidance in our quarterly earnings conference calls, quarterly earnings releases, or otherwise, regarding our future performance that represents our management's estimates as of the date of release. This guidance, which will include forward-looking statements, will be based on projections prepared by our management. This guidance will not be prepared with a view toward compliance with published guidelines of the American Institute of Certified Public Accountants (AICPA) regarding projections or the SEC regarding forward-looking statements, and neither our independent registered public accounting firm nor any other independent expert or outside party compiles or examines the projections. Accordingly, no such person will express any opinion or any other form of assurance with respect to the projections.

Projections are based upon a number of assumptions and estimates that, while presented with numerical specificity, are inherently subject to significant business, economic and competitive uncertainties and contingencies, many of which are beyond our control and are based upon specific assumptions with respect to future business decisions, some of which will change. We intend to state possible outcomes as high and low ranges which are intended to provide a sensitivity analysis as variables are changed but are not intended to imply that actual results could not fall outside of the suggested ranges. The principal reason that we release guidance is to provide a basis for our management to discuss our business outlook with analysts and investors. We do not accept any responsibility for any projections or reports published by any such third parties.

Guidance is necessarily speculative in nature, and it can be expected that some or all of the assumptions underlying the guidance furnished by us will not materialize or will vary significantly from actual results. Accordingly, our guidance is only an estimate of what management believes is realizable as of the date of release. Actual results may vary from our guidance and the variations may be material. In light of the foregoing, investors are urged not to rely upon our guidance in making an investment decision regarding our common stock.

Any failure to successfully implement our operating strategy or the occurrence of any of the events or circumstances set forth in this "Risk factors" section in this Form 10-Q could result in the actual operating results being different from our guidance, and the differences may be adverse and material.

Rapidly changing technology and extensive competition in synthetic biology could make the products we are developing and producing obsolete or non-competitive unless we continue to develop and manufacture new and improved products and pursue new market opportunities.

The synthetic biology industry is characterized by rapid and significant technological changes, frequent new product introductions and enhancements and evolving industry demands and standards. Our future success will depend on our ability to continually improve the products we are developing and producing, to develop and introduce new products that address the evolving needs of our customers on a timely and cost-effective basis and to pursue new market opportunities that develop as a result of technological and scientific advances. These new market opportunities may be outside the scope of our proven expertise or in areas which have unproven market demand, and the utility and value of new products and services developed by us may not be accepted in the markets served by the new products. Our inability to gain market acceptance of existing products in new markets or market acceptance of new products could harm our future operating results. Our future success also depends on our ability to manufacture these new and improved products to meet customer demand in a timely and cost-effective manner, including our ability to resolve manufacturing issues that may arise as we commence production of any new products we develop. Unanticipated difficulties or delays in replacing existing products with new products we introduce or in manufacturing improved or new products in sufficient quantities to meet customer demand could diminish future demand for our products and harm our future operating results.

In addition, there is extensive competition in the synthetic biology industry, and our future success will depend on our ability to maintain a competitive position with respect to technological advances. Technological development by others may result in our technologies, as well as products developed using our technologies, becoming obsolete. Our ability to compete successfully will depend on our ability to develop proprietary technologies and products that are technologically superior to and/or are less expensive than our competitors' technologies and products. Our competitors may be able to develop competing and/or superior technologies and processes and compete more aggressively and sustain that competition over a longer period of time.

The continued success of our business relies heavily on our disruptive technologies and products and our position in the market as a leading provider or synthetic DNA using a silicon chip.

Our future profitability will depend on our ability to successfully execute and maintain a sustainable business model and generate continuous streams of revenue. Our business model is premised on the fact that we are the only DNA synthesis provider to synthesize DNA on a silicon chip and the competitive advantages this creates. Our DNA synthesis methods, among other things, reduce the amount of raw materials required, speed up the synthesis process and deliver large volumes of high-quality synthetic DNA at low unit cost. However, if other competitors develop and commercialize a manufacturing process using a silicon chip or other similar technologies providing for the development of competitive synthetic DNA products at scale, this could be disruptive to our business model and could adversely affect our business prospects, financial condition and results of operations. If we are unable to convert sufficient number of current manufacturers of synthetic DNA to buyers of our synthetic DNA, surpass our competitors regarding certain industry-related data points, and effectively implement our e-commerce platform which facilitates efficient order entry and fulfillment for our customers, our business, prospects, financial condition and results of operation will be adversely affected.

If we are unable to expand into adjacent addressable markets, our business may be materially and adversely affected.

Our future revenue growth and market potential may depend on our ability to leverage our DNA synthesis platform together with our custom libraries and other proprietary tools, such as our anti-GPCR library and antibody optimization solution, in adjacent businesses such as pharmaceutical biologics drug discovery and digital data storage in DNA. However, we may not be able to validate that our antibody libraries will accelerate the lead identification and lead optimization steps of antibody discovery or will allow us to discover more effective antibody drugs. In addition, our technology may not develop in a way that allows data storage in DNA to become cost competitive with traditional data storage media or in a way that otherwise enables us to address the markets opportunities that we believe exist. If we are unable to expand into adjacent addressable markets, our business, financial position and results of operations could be negatively impacted.

A significant portion of our sales depends on customers' capital spending budgets that may be subject to significant and unexpected variation, including seasonality.

Our customers' spending on research and development impacts our sales and profitability. Our customers and potential customers include healthcare, agriculture, industrial chemicals and academic research sectors, and their capital spending budgets can have a significant effect on the demand for our products. Their research and development budgets are based on a wide variety of factors, including factors beyond our control, such as:

- the allocation of available resources to make purchases;
- funding from government sources;
- changes in government programs that provide funding to research institutions and companies;
- the spending priorities among various types of research equipment;
- policies regarding capital expenditures during recessionary periods;
- macroeconomic conditions and the political climate;
- changes in the regulatory environment;
- differences in budgetary cycles; and
- market acceptance of relatively new technologies, such as ours.

Any decrease in capital spending or change in spending priorities of our customers and potential customers could significantly reduce the demand for our products. As we expand into new geographic markets, our revenue may be impacted by seasonal trends in the different regions, the seasonality of customer capital budgets in those regions and the mix of domestic versus international sales. Moreover, we have no control over the timing and amount of purchases by these customers and potential customers, and as a result, revenue from these sources may vary significantly due to factors that can be difficult to forecast. Any delay or reduction in purchases by customers and potential customers or our inability to forecast fluctuations in demand could harm our future operating results.

We generally do not have long-term contracts with our customers requiring them to purchase any specified quantities from us.

We generally do not have long-term contracts with our customers requiring them to purchase any specified quantities from us and without such contracts our customers are not obligated to order or reorder our products. As a result, we cannot accurately predict our customers' decisions to reduce or cease purchasing our products. Additionally, even where we enter into contracts with our customers, there is no guarantee that such agreements will be negotiated on terms that are commercially favorable to us in the long-term. Therefore, if many of our customers were to substantially reduce their transaction volume or cease ordering products from us, this could materially and adversely affect our financial performance.

We have limited experience in sales and marketing of our products and, as a result, may be unable to successfully increase our market share and expand our customer base.

We have limited experience in sales and marketing of our products. Our ability to achieve profitability depends on our being able to increase our market share and expand our customer base. Although members of our sales and marketing teams have considerable industry experience and have engaged in marketing activities for our products, in the future we must expand our sales, marketing, distribution and customer support capabilities with the appropriate technical expertise to effectively market our products. To perform sales, marketing, distribution and customer support successfully, we will face a number of risks, including:

- we may not be able to attract, retain and manage the sales, marketing and service force necessary to publicize and gain broader market acceptance for our technology;
- the time and cost of establishing a specialized sales, marketing and service force for a particular product or service, which may be difficult to justify in light of the revenue generated; and
- our sales, marketing and service force may be unable to initiate and execute successful commercialization activities with respect to new products or markets we may seek to enter.

If our sales and marketing efforts, or those of any third-party sales and distribution partners, are not successful, our new technologies and products may not gain market acceptance, which could materially impact our business operations.

We have limited experience in manufacturing our DNA synthesis equipment and tools. If we are unable to expand our DNA synthesis manufacturing capacity, this would result in lost revenue and harm our business.

In order to expand our manufacturing capacity of new and existing products, we need to either build additional internal manufacturing capacity, contract with one or more partners, or both. Our technology and the production process for our DNA synthesis equipment and tools are complex, involving specialized parts, and we may encounter unexpected difficulties in manufacturing our DNA synthesis equipment and tools. There is no assurance that we will be able to continue to build manufacturing capacity internally or find one or more suitable partners, or both, to meet the volume and quality requirements necessary to be successful in our existing and potential markets. Manufacturing and product quality issues may arise as we increase the scale of our production. If our DNA synthesis equipment and tools do not consistently produce DNA products that meet our customers' performance expectations, our reputation may be harmed, and we may be unable to generate sufficient revenue to become profitable. Any delay or inability in establishing or expanding our manufacturing capacity could diminish our ability to develop or sell our products, which could result in lost revenue and materially harm our business, financial condition and results of operations.

We are substantially dependent on the success of our synthetic DNA products.

To date, we have invested nearly all of our efforts and financial resources in the research and development of our synthetic DNA products. The DNA synthesis business is very capital intensive, particularly for early stage companies that do not have significant off-setting revenues.

Our financial results are dependent on strengthening our core business while diversifying into other developing sectors such as pharmaceutical biologics drug discovery and data storage. Substantially all of our revenue generated to date is from our synthetic DNA products.

Our near-term prospects, including our ability to finance our Company and enter into strategic collaborations, will depend heavily on the successful development and commercialization of our synthetic DNA products. These initiatives will be substantially dependent on our ability to generate revenue from our synthetic DNA products and obtain other funding necessary to support these initiatives. Our inability to continue these initiatives and initiate new research and development efforts could result in a failure to develop new products, improve upon existing products such that sectors like pharmaceutical biologics drug discovery and data storage may never be fully developed, and expand our addressable market which could have a material and adverse impact on our sales, business, financial position and results of operations.

We and our chief executive officer are currently involved in litigation with Agilent Technologies, Inc., in which Agilent has alleged a claim of trade secret misappropriation against Twist Bioscience and trade secret misappropriation and other related claims against our chief executive officer, and an adverse result could harm our business and results of operations.

We and our chief executive officer are currently involved in litigation with Agilent in which Agilent has alleged a claim of trade secret misappropriation against our Company and trade secret misappropriation and other related claims against our chief executive officer and also against two other individuals: a current Company employee and a former Company employee. This litigation with Agilent could result in significant expense. Agilent has considerable resources available to it; we, on the other hand, are an early-stage commercial company with comparatively few resources available to us to engage in costly and protracted litigation. Intellectual property infringement claims asserted against us could be costly to defend and could limit our ability to use some technologies in the future. They will be time consuming, will divert our chief executive officer's, management's and scientific personnel's attention, may be used by Agilent in an effort to generate negative publicity with our customers and investors, and may result in liability for substantial damages. For example, we have incurred and anticipate that we will continue to incur significant expense and substantial time in defending against our current intellectual property infringement dispute with Agilent. In another example, we have incurred and anticipate that we will continue to incur significant expense and substantial time in preparing and prosecuting counterclaims alleged against Agilent. We anticipate that Agilent may use litigation, including filing amended or new complaints, other court filings, public statements and press releases, regardless of merit in an attempt to disrupt our business and create uncertainty about our future prospects, which could create volatility in the trading price of our common stock or damage to our reputation in the marketplace.

An adverse judgment in the Agilent proceeding could require us to pay damages, attorneys' fees, costs and expenses, or result in injunctive relief, or generate negative publicity, any of which could materially adversely affect our business, financial condition, results of operations and prospects. For more information on our current legal and regulatory proceedings, see the section of this Form 10-Q captioned " Legal proceedings." And for other risks related to our intellectual property, see the section of this Form 10-Q captioned "Risks related to our intellectual property." We may also in the future be involved with other litigation. We expect that the number of such claims may increase as our scale and the level of competition in our industry segments grows.

We depend on one single-source supplier for a critical component for our DNA synthesis process. The loss of this supplier or its failure to supply us with the necessary component on a timely basis, could cause delays in the future capacity of our DNA synthesis process and adversely affect our business.

We depend on one single-source supplier for a critical component for our DNA synthesis process. We do not currently have the infrastructure or capability internally to manufacture this component. Although we have a substantial reserve of supplies and although alternative suppliers exist for this critical component of our synthesis process, our existing DNA synthesis manufacturing process has been designed based on the functions, limitations, features and specifications of the components that we currently utilize. We have a supply agreement in place with this component supplier. However, there can be no assurance that our supply of this component will not be limited, interrupted, or of satisfactory quality or continue to be available at acceptable prices. Additionally, we do not have any control over the process or timing of the acquisition or manufacture of materials by our manufacturer and cannot ensure that it will deliver to us the component we order on time, or at all.

The loss of this component provided by this supplier could require us to change the design of our manufacturing process based on the functions, limitations, features and specifications of the replacement components. In addition, the lead time needed to establish a relationship with a new supplier can be lengthy, and we may experience delays in meeting demand in the event we must switch to a new supplier. The time and effort to qualify a new supplier could result in additional costs, diversion of resources or reduced manufacturing yields, any of which would negatively impact our operating results. Further, we may be unable to enter into agreements with a new supplier on commercially reasonable terms, which could have a material adverse impact on our business. Our dependence on this single-source supplier exposes us to certain risks, including the following:

- our supplier may cease or reduce production or deliveries, raise prices or renegotiate terms;
- we may be unable to locate a suitable replacement on acceptable terms or on a timely basis, if at all;
- if there is a disruption to our single-source supplier's operations, and if we are unable to enter into arrangements with alternative suppliers, we will have no other means of completing our synthesis process until they restore the affected facilities or we or they procure alternative manufacturing facilities or sources of supply;
- delays caused by supply issues may harm our reputation, frustrate our customers and cause them to turn to our competitors for future projects; and
- our ability to progress our DNA synthesis products could be materially and adversely impacted if the single-source supplier upon which we rely were to experience a significant business challenge, disruption or failure due to issues such as financial difficulties or bankruptcy, issues relating to other customers such as regulatory or quality compliance issues, or other financial, legal, regulatory or reputational issues.

Moreover, to meet anticipated market demand, our single-source supplier may need to increase manufacturing capacity, which could involve significant challenges. This may require us and our supplier to invest substantial additional funds and hire and retain the technical personnel who have the necessary experience. Neither we nor our supplier may successfully complete any required increase to existing manufacturing capacity in a timely manner, or at all.

We must continue to secure and maintain sufficient and stable supplies of raw materials.

Although historically we have not experienced price increases due to unexpected raw material shortages and other unanticipated events, there is no assurance that our supply of raw materials will not be significantly adversely affected in the future, adversely affecting our business, prospects, financial condition and results of operation.

In addition, as we grow, our existing suppliers may not be able to meet our increasing demand, and we may need to find additional suppliers. There is no assurance that we will always be able to secure suppliers who provide raw materials at the specification, quantity and quality levels that we demand (or at all) or be able to negotiate acceptable fees and terms of services with any such suppliers. Identifying a suitable supplier is an involved process that requires us to become satisfied with their quality control, responsiveness and service, financial stability and labor and other ethical practices. Even if we are able to expand existing sources, we may encounter delays in production and added costs as a result of the time it takes to train suppliers in our methods, products and quality control standards.

We typically do not enter into agreements with our suppliers but secure our raw materials on a purchase order basis. Our suppliers may reduce or cease their supply of raw materials and outsourced services and products to us at any time in the future. If the supply of raw materials and the outsourced services and products is interrupted, our production processes may be delayed. If any such event occurs, our operation and financial position may be adversely affected.

A deterioration of our relationship with any of our suppliers, or problems experienced by these suppliers, could lead to shortages in our production capacity for some or all of our products. In such case, we may not be able to fulfill the demand of existing customers or supply new customers. A raw material shortage or an increase in the cost of the raw materials we use could result in decreased revenue or could impair our ability to maintain or expand our business.

In the event of significant price increases for raw materials, we may have to pass the increased raw materials costs to our customers. However, we cannot assure you that we will be able to raise the prices of our products sufficiently to cover increased costs resulting from increases in the cost of our raw materials or overcome the interruption of a sufficient supply of qualified raw materials for our products. As a result, a price increase for our raw materials may negatively impact our business, financial position and results of operations.

We may encounter difficulties in managing our growth, and these difficulties could impair our profitability.

Currently, we are working simultaneously on multiple projects targeting several market sectors, including activities in the healthcare, agriculture, industrial chemicals and academic sectors. These diversified operations place significant demands on our limited resources and require us to substantially expand the capabilities of our technical, administrative and operational resources.

If we are unable to manage this growth effectively, our business and operating results could suffer. Our ability to manage our operations and costs, including research and development, costs of components, manufacturing, sales and marketing, requires us to continue to enhance our operational, financial and management controls, reporting systems and procedures and to attract and retain sufficient numbers of talented employees. Failure to attract and retain sufficient numbers of talented employees will further strain our human resources and could impede our growth.

Our revenue, results of operations, cash flows and reputation in the marketplace may suffer upon the loss of a significant customer.

We have derived, and believe we may continue to derive, a significant portion of our revenues from one large customer or a limited number of large customers. Our largest customer Ginkgo Bioworks accounted for 30%, 40% and 34% of our revenues for the fiscal years ended September 30, 2016, 2017 and 2018, respectively. Our customers may buy less of our products depending on their own technological developments, end-user demand for our products and internal budget cycles. In addition, existing customers may choose to produce some or all of their synthetic DNA requirements internally by using or developing manufacturing capabilities organically or by using capabilities from acquisitions of assets or entities from third parties with such capabilities. For example, in January 2017, Ginkgo Bioworks announced the acquisition of Gen9, Inc., which was a DNA synthesis manufacturer. If Ginkgo Bioworks reduces the amount of products it purchases from us and increases the amount of synthetic DNA products it manufactures internally using the capabilities acquired in the Gen9 acquisition or otherwise, it could have a material adverse impact on our revenue, results of operations, cash flows and reputation in the marketplace. The loss of Ginkgo Bioworks as a customer, or the loss of any other significant customer or a significant reduction in the amount of product ordered by Ginkgo Bioworks or any other significant customer would adversely affect our revenue, results of operations, cash flows and reputation in the marketplace.

Our credit facility contains restrictions that limit our flexibility in operating our business.

In September 2017, we entered into an amended and restated loan and security agreement with SVB. Our credit facility contains various covenants that limit our ability to engage in specified types of transactions. These covenants limit our ability to, among other things:

- sell, transfer, lease or otherwise dispose of our assets;
- create, incur or assume additional indebtedness;
- engage in certain changes in business, management, control, or business location
- encumber or permit liens on certain of our assets;
- make restricted payments, including paying dividends on, repurchasing or making distributions with respect to our common stock;
- make specified investments (including loans and advances);
- consolidate, merge, sell or otherwise dispose of all or substantially all of our assets or acquire other entities;
- make or permit any payment on any subordinated debt; and
- enter into certain transactions with our affiliates.

Our incurrence of this debt, and any future increases in our aggregate level of debt, may adversely affect our operating results and financial condition by, among other things:

- increasing our vulnerability to downturns in our business, to competitive pressures and to adverse economic and industry conditions;
- requiring the dedication of an increased portion of our expected cash flows from operations to service our indebtedness, thereby reducing the amount of expected cash flows available for other purposes, including capital expenditures, acquisitions and dividends; and
- limiting our flexibility in planning for, or reacting to, changes in our business and our industry.

A breach of any of these covenants could result in a default under our credit facility. Upon the occurrence of an event of default under our credit facility, SVB could elect to declare all amounts outstanding under our credit facility to be immediately due and payable and terminate all commitments to extend further credit. If we were unable to repay those amounts, the lenders under our credit facility could proceed against the collateral granted to them to secure such indebtedness. We have pledged substantially all of our assets, other than our intellectual property, as collateral under our credit facility.

We depend on the continuing efforts of our senior management team and other key personnel. If we lose members of our senior management team or other key personnel or are unable to successfully retain, recruit and train qualified researchers, engineering and other personnel, our ability to develop our products could be harmed, and we may be unable to achieve our goals.

Our future success depends upon the continuing services of members of our senior management team and scientific and engineering personnel. We are highly dependent on Emily Leproust, our President and Chief Executive Officer, who is employed "at will," meaning we or she may terminate the employment relationship at any time. In particular, our researchers and engineers are critical to our future technological and product innovations, and we will need to hire additional qualified personnel. We may not be able to attract and retain qualified personnel on acceptable terms, or at all. In addition, to the extent we hire personnel from competitors, we may be subject to allegations that they have been improperly solicited or that they have divulged proprietary or other confidential information, or that their former employers own their research output. Our industry, particularly in the San Francisco Bay Area, is characterized by high demand and intense competition for talent, and the turnover rate can be high. We compete for qualified management and scientific personnel with other life science companies, academic institutions and research institutions, particularly those focusing on genomics. Many of these employees could leave our company with little or no prior notice and would be free to work for a competitor. If one or more of our senior executives or other key personnel were unable or unwilling to continue in their present positions, we may not be able to replace them easily or at all, and other senior management may be required to divert attention from other aspects of the business. In addition, we do not have "key person" life insurance policies covering members of our management team or other key personnel except Emily Leproust. The loss of any of these individuals or our inability to attract or retain qualified personnel, including researchers, engineers and others, could prevent us from pursuing collaborations and adversely affect our product development and introductions, business growth prospects, results of operations and financial condition.

We may engage in strategic transactions, including acquisitions that could disrupt our business, cause dilution to our stockholders, reduce our financial resources, or prove not to be successful.

In the future, we may enter into transactions to acquire other businesses, products or technologies and our ability to do so successfully cannot be ensured. In April 2016, we acquired Genome Compiler Corporation, which became a wholly owned subsidiary. This acquisition allowed us to add software design capabilities for our e-commerce ordering system. However, to date, we have not successfully concluded other acquisitions, and we are pursuing opportunities in the life sciences industry that complement and expand our synthetic DNA product, products and markets both locally and internationally. If we identify suitable opportunities, we may not be able to make such acquisitions on favorable terms or at all. Any acquisitions we make may not strengthen our competitive position, and these transactions may be viewed negatively by customers or investors. We may decide to incur debt in connection with an acquisition or issue our common stock or other equity securities to the stockholders of the acquired company, which would reduce the percentage ownership of our existing stockholders. We could incur losses resulting from undiscovered liabilities of the acquired business that are not covered by any indemnification we may obtain from the seller. In addition, we may not be able to successfully integrate the acquired personnel, technologies and operations into our existing business in an effective, timely and non-disruptive manner. Acquisitions may also divert management attention from day-to-day responsibilities, increase our expenses and reduce our cash available for operations and other uses. In addition, we cannot guarantee that we will be able to fully recover the costs of such acquisitions or that we will be successful in leveraging any such strategic transactions into increased business, revenue or profitability. We also cannot predict the number, timing or size of any future acquisitions or the effect that any such transactions might have on our operating results.

From time to time, we may consider other strategic transactions, including collaborations. The competition for collaborators is intense, and the negotiation process is time-consuming and complex. Any new collaboration may be on terms that are not optimal for us, and we may not be able to maintain any new collaboration. Any such collaboration may require us to incur non-recurring or other charges, increase our near- and long-term expenditures and pose significant integration or implementation challenges or disrupt our management or business. These transactions would entail numerous operational and financial risks, including exposure to unknown liabilities, disruption of our business and diversion of our management's time and attention to manage a collaboration, incurrence of substantial debt or dilutive issuances of equity securities to pay transaction consideration or costs, higher than expected collaboration, acquisition or integration costs, write-downs of assets or goodwill or impairment charges, increased amortization expenses, difficulty and cost in facilitating the collaboration or combining the operations and personnel of any acquired business, impairment of relationships with key suppliers, manufacturers or customers of any acquired business due to changes in management and ownership and the inability to retain key employees of any acquired business. Accordingly, although there can be no assurance that we will undertake or successfully complete any collaborations, any transactions that we do complete may be subject to the foregoing or other risks and have a material and adverse effect on our business, financial condition, results of operations and prospects. Conversely, any failure to enter any collaboration or other strategic transaction that would be beneficial to us could delay the development and potential commercialization of our products and technologies.

As we expand our development and commercialization activities outside of the United States, we will be subject to an increased risk of inadvertently conducting activities in a manner that violates the U.S. Foreign Corrupt Practices Act and similar laws. If that occurs, we may be subject to civil or criminal penalties which could have a material adverse effect on our business, financial condition, results of operations and growth prospects.

We are subject to the U.S. Foreign Corrupt Practices Act, or the FCPA, which prohibits corporations and individuals from paying, offering to pay, or authorizing the payment of anything of value to any foreign government official, government staff member, political party, or political candidate in an attempt to obtain or retain business or to otherwise influence a person working in an official capacity. We are also subject to the UK Anti-Bribery Act, which prohibits both domestic and international bribery, as well as bribery across both public and private sectors.

In the course of establishing and expanding our commercial operations and complying with non-U.S. regulatory requirements, we will need to establish and expand business relationships with various third parties and we will interact more frequently with foreign officials, including regulatory authorities. Expanded programs to maintain compliance with such laws will be costly and may not be effective. Any interactions with any such parties or individuals where compensation is provided that are found to be in violation of such laws could result in substantial fines and penalties and could materially harm our business. Furthermore, any finding of a violation under one country's laws may increase the likelihood that we will be prosecuted and be found to have violated another country's laws. If our business practices outside the United States are found to be in violation of the FCPA, UK Anti-Bribery Act or other similar laws, we may be subject to significant civil and criminal penalties which could have a material adverse effect on our financial condition and results of operations.

We could engage in exporting or related activity that contravenes international trade restraints, or regulatory authorities could promulgate more far reaching international trade restraints, which could give rise to one or more of substantial legal liability, impediments to our business and reputational damage.

Our international business activities must comport with U.S. export controls and other international trade restraints, including the U.S. Department of Commerce's Export Administration Regulations and economic sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls.

We have established an international trade compliance program that encompasses best practices for preventing, detecting and addressing noncompliance with international trade restraints. Furthermore, to date our exports have not been licensable under export controls; however, we could fail to observe the compliance program requirements in a manner that leaves us in noncompliance with export controls or other international trade restraints. In addition, authorities could promulgate international trade restraints that impinge on our ability to prosecute our business as planned. One or more of resulting legal penalties, restraints on our business or reputational damage could have material adverse effects on our business and financial condition.

Adverse conditions in the global economy and disruption of financial markets may significantly harm our revenue, profitability and results of operations.

The global economy has a significant impact on our business and volatility and disruption of financial markets could limit our customers' ability to obtain adequate financing or credit to purchase and pay for our products in a timely manner or to maintain operations, which could result in a decrease in sales volume that could harm our results of operations. General concerns about the fundamental soundness of domestic and international economies may also cause our customers to reduce their purchases. Changes in banking, monetary and fiscal policies to address liquidity and increase credit availability may not be effective. Significant government investment and allocation of resources to assist the economic recovery of sectors which do not include our customers may reduce the resources available for government grants and related funding for life sciences research and development.

Continuation or further deterioration of these financial and macroeconomic conditions could significantly harm our sales, profitability and results of operations.

We operate in a highly competitive industry and if we are not able to compete effectively, our business and operating results will likely be harmed.

We face competition from a broad range of providers of core synthetic biology products such as GenScript Biotech Corporation, GENEWIZ, Integrated DNA Technologies, Inc., DNA 2.0 Inc. d/b/a/ ATUM, GeneArt (owned by Thermo Fisher Scientific Inc.), Eurofins Genomics LLC, Sigma-Aldrich Corporation (an indirect wholly owned subsidiary of Merck & Company), Promega Corporation, OriGene Technologies, Inc., Blue Heron Biotech, LLC and others. Additionally, we compete with both large and emerging providers in the life sciences tools and diagnostics industries focused on sample preparation for next generation sequencing such as Thermo Fisher Scientific Inc., Illumina, Inc., Integrated DNA Technologies, Inc., Agilent, and Roche NimbleGen, Inc. In the antibody discovery market, we compete with clinical research organizations, such as LakePharma (mouse hybridoma, llama immune libraries, XOMA phage display library) and Aldevron, LLC (genetic mouse immunization coupled with hybridoma), and antibody discovery biotechnology companies, such as Iontas (human phage display libraries, human phage display library focused on ion channels), Adimab (human synthetic yeast display libraries), and Distributed Bio (human synthetic phage display library, lead optimization libraries). In the field of DNA digital data storage, we compete with Catalog Technologies, Inc., ETH Zurich, Helixworks, Iridia, Inc., North Shore Bio and Roswell. We may not be successful in maintaining our competitive position for a number of reasons. Some of our current competitors, as well as many of our potential competitors, have significant name recognition, substantial intellectual property portfolios, longer operating histories, greater resources to invest in new technologies, substantial experience in new product development and manufacturing capabilities and more established distribution channels to deliver products to customers than we do. These competitors may be able to respond more quickly and effectively than we can to new or changing opportunities, technologies, standards or customer requirements. Our competitors may develop disruptive technologies or products that are comparable or superior to our technologies and products. In light of these advantages, even though we believe our technology is superior to the products offerings of our competitors, current or potential customers might accept competitive products in lieu of purchasing our products. Increased competition is likely to result in continued pricing pressures, which could harm our sales, profitability or market share. Our failure to continue competing effectively or wining additional business with our existing customers could materially and adversely affect our business, financial condition or results of operations.

We may be subject to significant pricing pressures.

Over time, increasing customer demand for lower prices could force us to discount our products and result in lower margins. The impact may be further exacerbated if we are unable to successfully control production costs. Alternatively, if due to rising market prices, our suppliers increase prices or reduce discounts on their supplies, we may be unable to pass on any cost increase to our customers, thereby resulting in reduced margins and profits. Furthermore, changes in our product mix may negatively affect our gross margins. Overall, these pricing pressures may adversely affect our business, financial position and results of operations.

Ethical, legal and social concerns surrounding the use of genetic information could reduce demand for our technology.

Our products may be used to create DNA sequences of humans, agricultural crops and other living organisms. Our products could be used in a variety of applications, which may have underlying ethical, legal and social concerns. Governmental authorities could, for safety, social or other purposes, impose limits on or implement regulation of the use of gene synthesis. Such concerns or governmental restrictions could limit the use of our DNA synthesis products, which could have a material adverse effect on our business, financial condition and results of operations. In addition, public perception about the safety and environmental hazards of, and ethical concerns over, genetically engineered products and processes could influence public acceptance of our technologies, products and processes. These concerns could result in increased expenses, regulatory scrutiny, delays or other impediments to our programs.

We use biological and hazardous materials that require considerable expertise and expense for handling, storage and disposal and may result in claims against us.

We work with materials, including chemicals, biological agents, and compounds and DNA samples that could be hazardous to human health and safety or the environment. Our operations also produce hazardous and biological waste products. Federal, state and local laws and regulations govern the use, generation, manufacture, storage, handling and disposal of these materials and wastes. Compliance with applicable environmental laws and regulations is expensive, and current or future environmental laws and regulations may restrict our operations. If we do not comply with applicable regulations, we may be subject to fines and penalties.

In addition, we cannot eliminate the risk of accidental injury or contamination from these materials or wastes, which could cause an interruption of our commercialization efforts, research and development programs and business operations, as well as environmental damage resulting in costly clean-up and liabilities under applicable laws and regulations. Furthermore, environmental laws and regulations are complex, change frequently and have tended to become more stringent. We cannot predict the impact of such changes and cannot be certain of our future compliance. While our property insurance policy provides limited coverage in the event of contamination from hazardous and biological products and the resulting cleanup costs, we do not currently have any additional insurance coverage for legal liability for claims arising from the handling, storage or disposal of hazardous materials.

Accordingly, in the event of contamination or injury, we could be liable for damages or penalized with fines in an amount exceeding our resources and our operations could be suspended or otherwise adversely affected.

We could develop DNA sequences or engage in other activity that contravenes biosecurity requirements, or regulatory authorities could promulgate more far reaching biosecurity requirements that our standard business practices cannot accommodate, which could give rise to substantial legal liability, impediments to our business and reputational damage.

The Federal Select Agent Program, or the FSAP, involves rules administered by the Centers for Disease Control and Prevention and Toxins and the Animal and Plant Health Inspection Service that regulate possession, use and transfer of biological select agents and toxins that have the potential to pose a severe threat to public, animal or plant health or to animal or plant products.

We have established a biosecurity program under which we follow biosafety and biosecurity best practices and avoid DNA synthesis activities that implicate FSAP rules; however, we could err in our observance of compliance program requirements in a manner that leaves us in noncompliance with FSAP or other biosecurity rules. In addition, authorities could promulgate new biosecurity requirements that restrictions our operations. One or more resulting legal penalties, restraints on our business or reputational damage could have material adverse effects on our business and financial condition.

Third parties may use our products in ways that could damage our reputation.

After our customers have received our products, we do not have any control over their use and our customers may use them in ways that are harmful to our reputation as a supplier of synthetic DNA products. In addition, while we have established a biosecurity program designed to comply with biosafety and biosecurity requirements and perform export control screening in an effort to ensure that third parties do not obtain our products for malevolent purposes, we cannot guarantee that these preventative measures will eliminate or reduce the risk of the domestic and global opportunities for the misuse of our products. Accordingly, in the event of such misuse, our reputation, future revenue and operating results may suffer.

Any damage to our reputation or brand may materially and adversely affect our business, financial condition and results of operations.

We believe that developing and maintaining our brand is important to our success and that our financial success is influenced by the perception of our brand by our customers. Furthermore, the importance of our brand recognition may become even greater to the extent that competitors offer more products similar to ours. Many factors, some of which are beyond our control, are important to maintaining our reputation and brand. These factors include our ability to comply with ethical, social, product, labor and environmental standards. Any actual or perceived failure in compliance with such standards could damage our reputation and brand.

Because we are subject to existing and potential additional governmental regulation, the markets for our products may be narrowed.

We are subject, both directly and indirectly, to the adverse impact of existing and potential future government regulation of our operations and markets. For example, export of our products is subject to strict regulatory control in a number of jurisdictions. The failure to satisfy export control criteria or obtain necessary clearances could delay or prevent shipment of products, which could adversely affect our revenues and profitability. Moreover, the life sciences industry, which is currently the primary market for our technology, has historically been heavily regulated. There are, for example, laws in several jurisdictions restricting research in genetic engineering, which can operate to narrow our markets. Given the evolving nature of this industry, legislative bodies or regulatory authorities may adopt additional regulation that adversely affects our market opportunities. Our business is also directly affected by a wide variety of government regulations applicable to business enterprises generally and to companies operating in the life science industry in particular. Failure to comply with these regulations or obtain or maintain necessary permits and licenses could result in a variety of fines or other censures or an interruption in our business operations which may have a negative impact on our ability to generate revenues and could increase the cost of operating our business.

Our products could in the future be subject to additional regulation by the U.S. Food and Drug Administration or other domestic and international regulatory agencies, which could increase our costs and delay our commercialization efforts, thereby materially and adversely affecting our business and results of operations.

The U.S. Food and Drug Administration, or FDA, regulates medical devices, including in vitro diagnostics, or IVDs. IVDs include reagents, instruments, and systems intended for use in diagnosis of disease or other conditions, including a determination of the state of health, in order to cure, mitigate, treat, or prevent disease or its sequelae. IVDs are intended for use in the collection, preparation, and examination of specimens taken from the human body. A research use only, or RUO, IVD product is an IVD product that is in the laboratory research phase of development and is being shipped or delivered for an investigation that is not subject to FDA's investigational device exemption requirements. As such, an RUO IVD is not intended for use in clinical investigations or in clinical practice. Such RUO products do not require premarket clearance or approval from the FDA, provided that they be labeled "For Research Use Only. Not for use in diagnostic procedures" pursuant to FDA regulations. Our IVD products are not intended for clinical or diagnostic use, and we market and label them as RUO. Accordingly, we have not sought clearance or approval from the FDA to market our products. However, the FDA may disagree with our assessment that our products are properly marketed as RUO, and may determine that our products are subject to pre-market clearance, approval, or other regulatory requirements. If the FDA determines that our products are subject to such requirements, we could be subject to enforcement action, including administrative and judicial sanctions, and additional regulatory controls and submissions for our tests, all of which could be burdensome.

Further, in the future, certain of our products or related applications could be subject to additional FDA regulation. Even where a product is not subject to FDA clearance or approval requirements, the FDA may impose restrictions as to the types of customers to which we can market and sell our products. Such regulation and restrictions may materially and adversely affect our business, financial condition and results of operations. Other regulatory regimes that do not currently present material challenges but that could in the future present material challenges include export controls and biosecurity.

Similarly, even though our products and services are not currently covered and reimbursed by third-party payors, including government healthcare programs such as Medicare and Medicaid, to the extent our products or related applications become eligible for coverage and reimbursement by such payors, we could be subject to healthcare fraud and abuse laws of both the federal government and the states in which we conduct our business. Because of the breadth of these laws and the narrowness of available statutory and regulatory exceptions, it is possible that some of our business activities could be subject to challenge under one or more of such laws. If we or our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines, imprisonment, and the curtailment or restructuring of our operations, any of which could materially adversely affect our ability to operate our business and our financial results.

Many countries have laws and regulations that could affect our products. The number and scope of these requirements are increasing. Unlike many of our competitors, this is an area where we do not have expertise. We may not be able to obtain regulatory approvals in such countries or may incur significant costs in obtaining or maintaining foreign regulatory approvals.

Certain of our potential customers may require that we become certified under the Clinical Laboratory Improvement Amendments of 1988.

Although we are not currently subject to the Clinical Laboratory Improvement Amendment of 1988, or CLIA, we may in the future be required by certain customers to obtain a CLIA certification. CLIA, which extends federal oversight over clinical laboratories by requiring that they be certified by the federal government or by a federally approved accreditation agency, is designed to ensure the quality and reliability of clinical laboratories by mandating specific standards in the areas of personnel qualifications, administration and participation in proficiency testing, patient test management, quality control, quality assurance and inspections. If our customers require a CLIA certification, we will have to continually expend time, money and effort to ensure that we meet the applicable quality and safety requirements, which may divert the attention of management and disrupt our core business operations.

If we experience a significant disruption in, or breach in security of, our information technology systems, or if we fail to implement new systems and software successfully, our business could be adversely affected.

We rely on several centralized information technology systems throughout our company to provide products, keep financial records, process orders, manage inventory, process shipments to customers and operate other critical functions. Our information technology systems may be susceptible to damage, disruptions or shutdowns due to power outages, hardware failures, computer viruses, attacks by computer hackers, telecommunication failures, user errors, catastrophes or other unforeseen events. Our information technology systems also may experience interruptions, delays or cessations of service or produce errors in connection with system integration, software upgrades or system migration work that takes place from time to time. If we were to experience a prolonged system disruption in the information technology systems that involve our interactions with customers or suppliers, including negatively impacting our order fulfilment and order entry on our e-commerce platform, it could result in the loss of sales and customers and significant incremental costs, which could adversely affect our business. In addition, security breaches of our information technology systems could result in the misappropriation or unauthorized disclosure of confidential information belonging to us or to our employees, partners, customers or suppliers, which could result in our suffering significant financial or reputational damage. Further, such a breach may require notification to governmental agencies, the media or individuals pursuant to various federal and state privacy and security laws. We would also be exposed to a risk of litigation and potential liability, which could materially adversely affect our business, results of operations and financial condition.

Our facilities in California are located near known earthquake faults, and the occurrence of an earthquake or other catastrophic disaster could cause damage to our facilities and equipment, which could require us to cease or curtail operations.

Our facilities in the San Francisco Bay Area are located near known earthquake fault zones and are vulnerable to damage from earthquakes. We are also vulnerable to damage from other types of disasters, including fire, floods, power loss, communications failures and similar events. If any disaster were to occur, our ability to operate our business at our facilities would be seriously, or potentially completely, impaired. In addition, the nature of our activities could cause significant delays in our research programs and commercial activities and make it difficult for us to recover from a disaster. The insurance we maintain may not be adequate to cover our losses resulting from disasters or other business interruptions. Accordingly, an earthquake or other disaster could materially and adversely harm our ability to conduct business.

Delivery of our products could be delayed or disrupted by factors beyond our control, and we could lose customers as a result.

We rely on third-party carriers for the timely delivery of our products. As a result, we are subject to carrier disruptions and increased costs that are beyond our control, including employee strikes, inclement weather and increased fuel costs. Any failure to deliver products to our customers in a timely and accurate manner may damage our reputation and brand and could cause us to lose customers. If our relationship with any of these third-party carriers is terminated or impaired or if any of these third parties is unable to deliver our products, the delivery and acceptance of our products by our customers may be delayed which could harm our business and financial results. The failure to deliver our products in a timely manner may harm our relationship with our customers, increase our costs and otherwise disrupt our operations.

Doing business internationally creates operational and financial risks for our business.

During our fiscal years ended September 30, 2016, 2017 and 2018, 22%, 23% and 31%, respectively, of our revenue was generated from customers located outside of the United States. In connection with our growth strategy, we intend to further expand in international markets. Conducting and launching operations on an international scale requires close coordination of activities across multiple jurisdictions and time zones and consumes significant management resources. If we fail to coordinate and manage these activities effectively, our business, financial condition or results of operations could be adversely affected. International sales entail a variety of risks, including longer payment cycles and difficulties in collecting accounts receivable outside of the United States, currency exchange fluctuations, challenges in staffing and managing foreign operations, tariffs and other trade barriers, unexpected changes in legislative or regulatory requirements of foreign countries into which we sell our products, difficulties in obtaining export licenses or in overcoming other trade barriers, laws and business practices favoring local companies, political and economic instability, difficulties protecting or procuring intellectual property rights, and restrictions resulting in delivery delays and significant taxes or other burdens of complying with a variety of foreign laws.

Changes in the value of the relevant currencies may affect the cost of certain items required in our operations. Changes in currency exchange rates may also affect the relative prices at which we are able to sell products in the same market. Our revenue from international customers may be negatively impacted as increases in the U.S. dollar relative to our international customers' local currency could make our products more expensive, impacting our ability to compete. Our costs of materials from international suppliers may increase if in order to continue doing business with us they raise their prices as the value of the U.S. dollar decreases relative to their local currency. Foreign policies and actions regarding currency valuation could result in actions by the United States and other countries to offset the effects of such fluctuations. The recent global financial downturn has led to a high level of volatility in foreign currency exchange rates and that level of volatility may continue, which could adversely affect our business, financial condition or results of operations.

Our ability to use our net operating loss carryforwards to offset future taxable income may be subject to certain limitations.

In general, under Section 382 of the Internal Revenue Code of 1986, as amended, or the Code, a corporation that undergoes an "ownership change" is subject to limitations on its ability to use its pre-change net operating loss carryforwards, or NOLs, to offset future taxable income. If the Internal Revenue Service challenges our analysis that our existing NOLs will not expire before utilization due to previous ownership changes, our ability to use our NOLs could be limited by Section 382 of the Code. Future changes in our stock ownership, some of which are outside of our control, could result in an ownership change under Section 382 of the Code. Furthermore, our ability to use NOLs of companies that we may acquire in the future may be subject to limitations. For these reasons, we may not be able to use a material portion of the NOLs reflected on our balance sheet, even if we attain profitability.

The enactment of legislation implementing changes in taxation of international business activities, the adoption of other corporate tax reform policies, or changes in tax legislation or policies could impact our future financial position and results of operations.

Corporate tax reform, base-erosion efforts and tax transparency continue to be high priorities in many tax jurisdictions where we intend to have business operations. As a result, policies regarding corporate income and other taxes in numerous jurisdictions are under heightened scrutiny and tax reform legislation is being proposed or enacted in a number of jurisdictions. For example, the Tax Cuts and Jobs Act of 2017, or the Tax Act, signed into law on December 22, 2017, adopting broad U.S. corporate income tax reform will, among other things, reduce the U.S. corporate income tax rate, but will impose base-erosion prevention measures on non-U.S. earnings of U.S. entities as well as a one-time mandatory deemed repatriation tax on accumulated non-U.S. earnings of U.S. entities.

In addition, many countries are beginning to implement legislation and other guidance to align their international tax rules with the Organization for Economic Co-operation's Base Erosion and Profit Shifting recommendations and action plan that aim to standardize and modernize global corporate tax policy, including changes to cross-border tax, transfer-pricing documentation rules, and nexus-based tax incentive practices.

Such legislative initiatives may materially and adversely affect our plans to expand internationally and may negatively impact our financial condition and results of operations generally.

Our inability to collect on our accounts receivable by a significant number of customers may have an adverse effect on our business, financial condition and results of operations.

Sales to our customers are generally made on open credit terms. Management maintains an allowance for potential credit losses. The average days sales outstanding of our trade receivables was 59 days, based on year-end balances and sales for the last 30 days of the year. If our customers' cash flow, working capital, financial conditions or results of operations deteriorate, they may be unable or even unwilling to pay trade receivables owed to us promptly or at all. As a result, we could be exposed to a certain level of credit risk. If a major customer experiences, or a significant number of customers experience, financial difficulties, the effect on us could be material and have an adverse effect on our business, financial condition and results of operations.

Risks related to being a public company

If we fail to maintain proper and effective internal controls, our ability to produce accurate financial statements on a timely basis could be impaired, which would adversely affect our business.

Ensuring that we have adequate internal financial and accounting controls and procedures in place to produce accurate financial statements on a timely basis is a costly and time-consuming effort that needs to be re-evaluated frequently. To ensure the level of segregation of duties customary for a U.S. public company and the requirement to produce timely financial information has created a need for additional resources within the accounting and finance functions. Consequently, we have hired additional resources in the accounting and finance function and continue to reassess the sufficiency of finance personnel in response to these increasing demands and expectations.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Our management does not expect that our internal control over financial reporting will prevent or detect all errors and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system's objectives will be met. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, within our company will have been detected.

Commencing with our fiscal year ending September 30, 2019, we must perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on the effectiveness of our internal control over financial reporting in our Form 10-K filing for that year, as required by Section 404 of the Sarbanes Oxley Act. We expect to expend significant resources in developing the necessary documentation and testing procedures required by Section 404. We cannot be certain that the actions we will be taking to improve our internal controls over financial reporting will be sufficient, or that we will be able to implement our planned processes and procedures in a timely manner. In addition, if we are unable to produce accurate financial statements on a timely basis, investors could lose confidence in the reliability of our financial statements, which could cause the market price of our common stock to decline and make it more difficult for us to finance our operations and growth.

We are an emerging growth company and we cannot be certain if the reduced disclosure requirements applicable to emerging growth companies will make our common stock less attractive to investors.

We are an "emerging growth company" as defined in the JOBS Act. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not "emerging growth companies."

For as long as we continue to be an emerging growth company, we also intend to take advantage of certain other exemptions from various reporting requirements that are applicable to other public companies including, but not limited to, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. We cannot predict if investors will find our common stock less attractive because we will rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

We will remain an emerging growth company until the earliest of (i) the last day of the fiscal year in which we have total annual gross revenue of $1.07 billion or more; (ii) the last day of our fiscal year following the fifth anniversary of the date of the closing of our initial public offering; (iii) the date on which we have issued more than $1.0 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the SEC.

The requirements of being a public company may strain our resources, divert management's attention and affect our ability to attract and retain qualified board members.

As a public company, we will be subject to the reporting requirements of the Exchange Act, the Sarbanes-Oxley Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act, or the Dodd-Frank Act, the listing requirements of the stock exchange on which our common stock is traded and other applicable securities rules and regulations. The SEC and other regulators have continued to adopt new rules and regulations and make additional changes to existing regulations that require our compliance. Stockholder activism, the current political environment, and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact, in ways we cannot currently anticipate, the manner in which we operate our business. Compliance with these rules and regulations may cause us to incur additional accounting, legal and other expenses that we did not incur as a private company. We also anticipate that we will incur costs associated with corporate governance requirements, including requirements under securities laws, as well as rules and regulations implemented by the SEC and the Nasdaq Global Select Market, particularly after we are no longer an "emerging growth company." We expect these rules and regulations to increase our legal and financial compliance costs and to make some activities more time-consuming and costly. Furthermore, these rules and regulations could make it more difficult or costlier for us to obtain certain types of insurance, including director and officer liability insurance, and we may be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. The impact of these requirements could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers. We are currently evaluating and monitoring developments with respect to these rules and regulations, and we cannot predict or estimate the amount of additional costs we may incur or the timing of such costs.

Risks related to our intellectual property

Our ability to protect our intellectual property and proprietary technology through patents and other means is uncertain.

Our commercial success depends in part on our ability to protect our intellectual property and proprietary technologies. We rely on patent protection, where appropriate and available, as well as a combination of copyright, trade secret and trademark laws, and nondisclosure, confidentiality and other contractual restrictions to protect our proprietary technology. However, these legal means afford only limited protection and may not adequately protect our rights or permit us to gain or keep any competitive advantage. As of June 30, 2018, we own nine issued U.S. patents and two issued international patents in China. There are 81 pending patent applications, including 39 in the United States, 31 international applications and 11 applications filed under the Patent Cooperation Treaty.

Several patent applications covering our technologies have been filed recently. We cannot offer any assurances about which, if any, patents will issue, the breadth of any such patent, or whether any issued patents will be found invalid and unenforceable or will be threatened by third parties. Any successful opposition to these patents or any other patents owned by or, if applicable in the future, licensed to us could deprive us of rights necessary for the practice of our technologies or the successful commercialization of products that we may develop. Since patent applications in the U.S. and most other countries are confidential for a period of time after filing, we cannot be certain that we were the first to file any patent application related to our technologies or products. Furthermore, an interference proceeding can be provoked by a third party or instituted by the U.S. Patent and Trademark Office, or the USPTO, to determine who was the first to invent any of the subject matter covered by the patent claims of our applications.

Patent law can be highly uncertain and involve complex legal and factual questions for which important principles remain unresolved. In the United States and in many international jurisdictions, policy regarding the breadth of claims allowed in patents can be inconsistent. The U.S. Supreme Court and the Court of Appeals for the Federal Circuit have made, and will likely continue to make, changes in how the patent laws of the United States are interpreted. Similarly, international courts have made, and will continue to make, changes in how the patent laws in their respective jurisdictions are interpreted. We cannot predict future changes in the interpretation of patent laws or changes to patent laws that might be enacted into law by U.S. and international legislative bodies.

Moreover, the United States Leahy-Smith American Invents Act, enacted in September 2011, brought significant changes to the U.S. patent system, including a change from a “first to invent” system to a “first to file” system. Under a “first to file” system, assuming the other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to the patent on an invention regardless of whether another inventor had made the invention earlier. Other changes affect the way the patent applications are prosecuted, redefine prior art, and may affect patent litigation. The USPTO developed new regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act became effective on March 16, 2013. The Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, which could have a material adverse effect on our business and financial condition.

If we are unable to obtain, maintain and enforce intellectual property protection, others may be able to make, use, or sell products and technologies substantially the same as ours, which could adversely affect our ability to compete in the market.

We may not pursue or maintain patent protection for our products in every country or territory in which we sell our products and technologies. In addition, our pending U.S. and foreign patent applications may not issue as patents or may not issue in a form that will be sufficient to protect our proprietary technology and gain or keep our competitive advantage. Any patents we have obtained or do obtain may be subject to re-examination, reissue, opposition or other administrative proceeding, or may be challenged in litigation, and such challenges could result in a determination that the patent is invalid or unenforceable.

Patents have a limited lifespan. Patent terms may be shortened or lengthened by, for example, terminal disclaimers, patent term adjustments, supplemental protection certificates, and patent term extensions. Although extensions may be available, the life of a patent, and the protection it affords, is limited. Patent term extensions and supplemental protection certificates, and the like, may be impacted by the regulatory process and may not significantly lengthen patent term. Non-payment or delay in payment of patent fees or annuities, delay in patent filings or delay in extension filing, whether intentional or unintentional, may also result in the loss of patent rights important to our business. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case. In addition, certain countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to other parties. Furthermore, many countries limit the enforceability of patents against other parties, including government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of any patents.

We cannot be certain that the steps we have taken will prevent unauthorized use or unauthorized reverse engineering of our technology. In addition, competitors may be able to design alternative methods or devices that avoid infringement of our patents. To the extent our intellectual property, including licensed intellectual property, offers inadequate protection, or is found to be invalid or unenforceable, we are exposed to a greater risk of direct competition. If our intellectual property does not provide adequate protection against our competitors’ products, our competitive position could be adversely affected, as could our business. Both the patent application process and the process of managing patent disputes can be time consuming and expensive.

Monitoring unauthorized use of our intellectual property is difficult and costly. From time to time, we review our competitors’ products, and may in the future seek to enforce our patents or other rights against potential infringement. However, the steps we have taken to protect our proprietary rights may not be adequate to prevent misappropriation of our intellectual property. We may not be able to detect unauthorized use of, or take appropriate steps to enforce, our intellectual property rights. We cannot guarantee that any of our patent searches or analyses, including but not limited to the identification of relevant patents, the scope of patent claims or the expiration of relevant patents, are complete or thorough, nor can we be certain that we have identified each and every third-party patent and pending application in the United States and abroad that is relevant to or necessary for the commercialization of our products in any jurisdiction. For example, U.S. applications filed before November 29, 2000 and certain U.S. applications filed after that date that will not be filed outside the United States remain confidential until patents issue. Patent applications in the United States and elsewhere are published approximately 18 months after the earliest filing for which priority is claimed. Therefore, patent applications covering our product candidates or technologies could have been filed by others without our knowledge. Additionally, pending patent applications that have been published can, subject to certain limitations, be later amended in a manner that could cover our platform technologies, our products or the use of our products or technologies. The scope of a patent claim is determined by an interpretation of the law, the written disclosure in a patent and the patent’s prosecution history. Our interpretation of the relevance or the scope of a patent or a pending application may be incorrect, which may negatively impact our ability to market our products. We may incorrectly determine that our products are not covered by a third-party patent or may incorrectly predict whether a third party’s pending application will issue with claims of relevant scope. Our determination of the expiration date of any patent in the United States or abroad that we consider relevant may be incorrect, which may negatively impact our ability to develop and market our product candidates.

Any inability to meaningfully protect our intellectual property could result in competitors offering products or technologies that incorporate our products or technologies, which could reduce demand for our products or technologies. A court or other judicial body may decide that the patent we seek to enforce is invalid or unenforceable or may refuse to stop the other party from using the technology at issue on the grounds that the patent in question does not cover the technology in question. An adverse result in any litigation could put one or more of our patents at risk of being invalidated or interpreted narrowly. Some of our competitors may be able to devote significantly more resources to intellectual property litigation and may have significantly broader patent portfolios to assert against us if we assert our rights against them.

We cannot predict the breadth of claims that may be allowed or enforced in our patents or in third-party patents. For example:

- we might not have been the first to make the inventions covered by each of our pending patent applications;
- we might not have been the first to file patent applications for these inventions;
- others may independently develop similar or alternative products and technologies or duplicate any of our products and technologies;
- it is possible that none of our pending patent applications will result in issued patents, and even if they issue as patents, they may not provide a basis for commercially viable products, or may not provide us with any competitive advantages, or may be challenged and invalidated by third parties;
- we may not develop additional proprietary products and technologies that are patentable;
- the patents of others may have an adverse effect on our business; and
- we apply for patents covering our products and technologies and uses thereof, as we deem appropriate. However, we may fail to apply for patents on important products and technologies in a timely fashion or at all.

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

Filing, prosecuting and defending patents on our technologies and products in all countries throughout the world would be prohibitively expensive. In addition, the laws of some non-U.S. countries do not protect intellectual property rights to the same extent as the laws of the United States, and many companies have encountered significant problems in protecting and defending such rights in foreign jurisdictions. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own technologies and products and further, may export otherwise infringing products to territories where we have patent protection, but enforcement is not as strong as that in the United States. These products may compete with our products, and our patents or other intellectual property rights may not be effective or sufficient enough to prevent them from competing.

The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to biotechnology, which could make it difficult for us to stop the infringement of our patents. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial cost and divert our efforts and attention from other aspects of our business, could put our own patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing, and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop.

If we are unable to protect the confidentiality of our proprietary information and know-how, the value of our technology and products could be adversely affected.

In addition to pursuing patents on our technology, we take steps to protect our intellectual property and proprietary technology by entering into confidentiality agreements and intellectual property assignment agreements with our employees, consultants, corporate partners and, when needed, our advisors. Such agreements may not be enforceable or may not provide meaningful protection for our trade secrets or other proprietary information in the event of unauthorized use or disclosure or other breaches of the agreements, and we may not be able to prevent such unauthorized disclosure. Monitoring unauthorized disclosure is difficult, and we do not know whether the steps we have taken to prevent such disclosure are, or will be, adequate. If we were to enforce a claim that a third party had illegally obtained and was using our trade secrets, it would be expensive and time consuming, and the outcome would be unpredictable. In addition, courts outside the United States may be less willing to protect trade secrets.

Trade secrets and know-how can be difficult to protect as trade secrets, and know-how will over time be disseminated within the industry through independent development, the publication of journal articles, and the movement of personnel skilled in the art from company to company. In addition, because we may rely on third parties in the development of our products, we may, at times, share trade secrets with them. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, material transfer agreements, consulting agreements or other similar agreements with third parties prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, including our trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. If we are unable to prevent material disclosure of the intellectual property related to our technologies to third parties, we will not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business, results of operations and financial condition.

Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either lawfully or through breach of our agreements with third parties, independent development or publication of information by any of our third-party collaborators. Competitors could willfully infringe our intellectual property rights, design around our protected technology or develop their own competitive technologies that fall outside of our intellectual property rights. In addition, if any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent such competitor from using that technology or information to compete with us, which could harm our competitive position. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have an adverse effect on our business and results of operations.

We may also be subject to claims that former employees, collaborators or other third parties have an ownership interest in our patents or other intellectual property. Other than the currently pending litigation filed by Agilent, described under the captions "Business—Legal proceedings" and "Risk factors—We and our chief executive officer are currently involved in litigation with Agilent in which Agilent has alleged a claim of trade secret misappropriation against Twist Bioscience and trade secret misappropriation and other related claims against our chief executive officer, and an adverse result could harm our business and results of operations", no legal claims against us are currently pending. Some of our employees were previously employed at universities or biotechnology or biopharmaceutical companies, including our competitors or potential competitors. We may be subject to claims that these employees or we have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights. A loss of key research personnel or their work product could hamper our ability to commercialize, or prevent us from commercializing, our products and technologies. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and distraction to management and other employees.

We may be involved in lawsuits to protect or enforce our patents and proprietary rights, to determine the scope, coverage and validity of others' proprietary rights, or to defend against third party claims of intellectual property infringement that could require us to spend significant time and money and could prevent us from selling our products or impact our stock price.

Litigation may be necessary for us to enforce our patent and proprietary rights and/or to determine the scope, coverage and validity of others' proprietary rights. Litigation on these matters has been prevalent in our industry and we expect that this will continue. As the biotechnology and synthetic biology industries expand and more patents are issued, the risk increases that there may be patents issued to third parties that relate to our technologies and products of which we are not aware or that we may need to challenge to continue our operations as currently contemplated. In addition, our competitors and others may have patents or may in the future obtain patents and claim that the use of our products or processes infringes these patents. As we move into new markets and applications for our products and processes, incumbent participants in such markets may assert their patents and other proprietary rights against us as a means of slowing our entry into such markets or as a means to extract substantial license and royalty payments from us.

To determine the priority of inventions, we may have to initiate and participate in interference proceedings declared by the USPTO that could result in substantial legal fees and could substantially affect the scope of our patent protection. Also, our intellectual property may be subject to significant administrative and litigation proceedings such as invalidity, unenforceability, re-examination and opposition proceedings against our patents. Whether merited or not, we may additionally face allegations that we have infringed the trademarks, copyrights, patents and other intellectual property rights of third parties, including patents held by our competitors or by non-practicing entities. If we fail to identify and correctly interpret relevant patents, we may be subject to infringement claims. We may also face allegations that our employees have misappropriated the intellectual property rights of their former employers or other third parties. The outcome of any litigation or other proceeding is inherently uncertain and the results might not be favorable to us. For more information on our current legal and regulatory proceedings, see the section of this Form 10-Q captioned "Legal proceedings."

In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, for example, lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO or made a misleading statement during prosecution. The outcome following legal assertions of invalidity and unenforceability during patent litigation is unpredictable. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of the patent protection on certain aspects of our platform technology. Such a loss of patent protection could have a material and adverse effect on our business, financial condition, results of operations and prospects.

Patent infringement suits can be expensive, lengthy and disruptive to business operations. We could incur substantial costs and divert the attention of our management and technical personnel in prosecuting or defending against any claims and may harm our reputation. Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. There can be no assurance that we will prevail in any suit initiated against us by third parties, successfully settle or otherwise resolve patent infringement claims. If we are unable to successfully settle claims on terms acceptable to us, we may be required to engage in or continue costly, unpredictable and time-consuming litigation and may be prevented from or experience substantial delays in marketing our technologies and products. Furthermore, parties making claims against us may be able to obtain injunctive or other relief, which could block our ability to develop, commercialize and sell products, and could result in the award of substantial damages against us, including treble damages and attorneys' fees and costs in the event that we are found to be a willful infringer of third party patents.

In the event of a successful claim of infringement against us, we may be required to obtain one or more licenses from third parties, which we may not be able to obtain at a reasonable cost, if at all. We could therefore incur substantial costs related to royalty payments for licenses obtained from third parties, which could negatively affect our gross margins. In addition, we could encounter delays in product introductions while we attempt to develop alternative methods or products to avoid infringing third-party patents or proprietary rights. Defense of any lawsuit or failure to obtain any required licenses on favorable terms could prevent us from commercializing our products, and the risk of a prohibition on the sale of any of our products could adversely affect our ability to grow and gain market acceptance for our products.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. In addition, during the course of this kind of litigation, there could be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. Finally, any uncertainties resulting from the initiation and continuation of any litigation could have a material adverse effect on our ability to raise the funds necessary to continue our operations.

In addition, our agreements with some of our suppliers, distributors, customers and other entities with whom we do business may require us to defend or indemnify these parties to the extent they become involved in infringement claims against us, including the claims described above. We could also voluntarily agree to defend or indemnify third parties in instances where we are not obligated to do so if we determine it would be important to our business relationships. If we are required or agree to defend or indemnify any of these third parties in connection with any infringement claims, we could incur significant costs and expenses that could adversely affect our business, operating results, or financial condition.

We may not be successful in obtaining or maintaining necessary rights to our products and technologies through acquisitions and in-licenses, and our intellectual property agreements with third parties may involve unfavorable terms or be subject to disagreements over contract interpretation.

We may find that our programs require the use of proprietary rights held by third parties, and the growth of our business may depend in part on our ability to acquire, in-license or use these proprietary rights. We may be unable to acquire or in-license compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify as necessary for our products and technologies. The licensing and acquisition of third-party intellectual property rights is a competitive area, and other companies may also be pursuing strategies to license or acquire third-party intellectual property rights that we may consider attractive. These companies may have a competitive advantage over us due to their size, financial resources and greater commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. Moreover, collaboration arrangements are complex and time-consuming to negotiate, document, implement and maintain. We may not be successful in our efforts to establish and implement collaborations or other alternative arrangements should we so choose to enter into such arrangements. We also may be unable to license or acquire third-party intellectual property rights on terms that would be favorable to us or would allow us to make an appropriate return on our investment.

We engage in discussions regarding other possible commercial and cross-licensing agreements with third parties from time to time. There can be no assurance that these discussions will lead to the execution of commercial license or cross-license agreements or that such agreements will be on terms that are favorable to us. Even if we are able to obtain a license to intellectual property of interest, we may not be able to secure exclusive rights, in which case others could use the same rights and compete with us. In addition, if we enter into cross-licensing agreements, there is no assurance that we will be able to effectively compete against others who are licensed under our patents.

In addition, provisions in our licensing and other intellectual property agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could affect the scope of our rights to the relevant intellectual property or technology or affect financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

We have not yet registered some of our trademarks in all of our potential markets, and failure to secure those registrations could adversely affect our business.

Some of our trademark applications may not be allowed for registration, and our registered trademarks may not be maintained or enforced. In addition, in the U.S. Patent and Trademark Office and in comparable agencies in many foreign jurisdictions, third parties are given an opportunity to oppose pending trademark applications and to seek to cancel registered trademarks. Opposition or cancellation proceedings may be filed against our trademarks, and our trademarks may not survive such proceedings.

In addition, third parties may file first for our trademarks in certain countries. If they succeed in registering such trademarks, and if we are not successful in challenging such third-party rights, we may not be able to use these trademarks to market our products and technologies in those countries. Over the long-term, if we are unable to establish name recognition based on our trademarks, then our marketing abilities may be materially adversely impacted.

We depend on certain technologies that are licensed to us. We do not control these technologies and any loss of our rights to them could prevent us from selling our products.

We rely on, or may in the future rely on, licenses in order to be able to use various proprietary technologies that are material to our business. We do not or will not own the patents that underlie these licenses. Our rights to use the technology we license are subject to the negotiation of, continuation of and compliance with the terms of those licenses. In some cases, we do not or will not control the prosecution, maintenance, or filing of the patents to which we hold licenses, or the enforcement of these patents against third parties. Some of our patents and patent applications were either acquired from another company who acquired those patents and patent applications from yet another company or are licensed from a third party. For example, Twist Bioscience acquired Genome Compiler Corporation in 2016, and Genome Compiler had a non-exclusive license to U.S. Patent No. 7,805,252 owned by DNA 2.0. Thus, these patents and patent applications are not written by us or our attorneys, and we did not have control over the drafting and prosecution. The former patent owners and our licensors might not have given the same attention to the drafting and prosecution of these patents and applications as we would have if we had been the owners of the patents and applications and had control over the drafting and prosecution. We cannot be certain that drafting and/or prosecution of the licensed patents and patent applications by the licensors have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents and other intellectual property rights.

Our rights to use the technology we license is subject to the validity of the owner's intellectual property rights. Enforcement of our licensed patents or defense or any claims asserting the invalidity of these patents is often subject to the control or cooperation of our licensors. Legal action could be initiated against the owners of the intellectual property that we license. Even if we are not a party to these legal actions, an adverse outcome could harm our business because it might prevent these other companies or institutions from continuing to license intellectual property that we may need to operate our business.

Our licenses contain or will contain provisions that allow the licensor to terminate the license upon specific conditions. Our rights under the licenses are subject to or will be subject to our continued compliance with the terms of the license, including the payment of royalties due under the license.

Termination of these licenses could prevent us from marketing some or all of our products. Because of the complexity of our products and the patents we have licensed, determining the scope of the license and related royalty obligation can be difficult and can lead to disputes between us and the licensor. An unfavorable resolution of such a dispute could lead to an increase in the royalties payable pursuant to the license. If a licensor believed we were not paying the royalties due under the license or were otherwise not in compliance with the terms of the license, the licensor might attempt to revoke the license. If such an attempt were successful, we might be barred from producing and selling some or all of our products.

Risks related to doing business in China

The People's Republic of China, or the PRC, government has the ability to exercise significant influence and control over our proposed wholly owned foreign entity in China.

The PRC plays a significant role in regulating industrial development by imposing business regulations. It also exercises significant control over the country's economic growth through the allocation of resources, controlling payment of foreign currency-denominated obligations, setting monetary policy and providing preferential treatment to particular industries or companies.

Additional factors that we may experience in connection with setting up operations in China that may adversely affect our business and results of operations include:

- our inability to enforce or obtain a remedy under our agreements;
- PRC restrictions on foreign investment that could impair our ability to conduct our business or acquire or contract with other entities in the future;
- restrictions on currency exchange that may limit our ability to use cash flow most effectively or to repatriate our investments;
- fluctuations in currency values;
- increased challenges of defending our intellectual property;
- cultural, language and managerial differences that may reduce our overall performance; and
- political instability in China.

We may not be able to enforce our rights in China.

China's legal and judicial system may negatively impact foreign investors. The legal system in China is evolving rapidly, and enforcement of laws is inconsistent. It may be impossible to obtain swift and equitable enforcement of laws or enforcement of the judgment of one court by a court of another jurisdiction. China's legal system is based on civil law or written statutes and a decision by one judge does not set a legal precedent that must be followed by judges in other cases. In addition, the interpretation of Chinese laws may vary to reflect domestic political changes.

There are substantial uncertainties regarding the interpretation and application to our business of PRC laws and regulations, since many of the rules and regulations that companies face in China are not made public. The effectiveness of newly enacted laws, regulations or amendments may be delayed, resulting in detrimental reliance by foreign investors. We cannot predict what effect the interpretation of existing or new PRC laws or regulations may have on the proposed business of our wholly foreign owned entity.

China is a developing nation governed by a one-party communist government and susceptible to political, economic, and social upheaval that could disrupt the economy.

China is a developing country governed by a one-party government. China is also a country with an extremely large population, wide income gaps between rich and poor and between urban and rural residents, minority ethnic and religious populations, and growing access to information about the different social, economic, and political systems found in other countries. China has also experienced extremely rapid economic growth over the last decade, and its legal and regulatory systems have had to change rapidly to accommodate this growth. If China experiences political or economic upheaval, labor disruptions or other organized protests, nationalization of private businesses, civil strife, strikes, acts of war and insurrections, this may disrupt China's economy and could materially and adversely affect the financial performance of our proposed wholly foreign owned entity.

If relations between China and the U.S. deteriorate, our business in China may be materially and adversely affected.

The relationship between China and the U.S. is subject to periodic tension. Relations may also be compromised if the U.S. becomes a more active advocate of Taiwan or pressures the PRC government regarding its monetary, economic or social policies. Changes in political conditions in China and changes in the state of China-U.S. relations are difficult to predict and could adversely affect the operations or financial condition of our proposed wholly owned foreign owned entity. In addition, because of our involvement in the Chinese market, any deterioration in political or trade relations might cause a public perception in the U.S. or elsewhere that might cause our products to become less attractive. A proposed enhancement of U.S. export controls is expected to apply to U.S. technology exports to China and Chinese companies, in addition to more stringent review of foreign investment in U.S. technology companies by the committee on foreign investment in the United States. We cannot predict what effect any changes in China-U.S. relations may have on our ability to access capital or effectively do business in China, including through the proposed business of our proposed wholly foreign owned entity.

Governmental control of currency conversion may limit our ability to utilize our revenues effectively and affect the value of your investment.

The PRC government imposes controls on the convertibility of the Chinese currency, Renminbi, into foreign currencies and, in certain cases, the remittance of currency out of China. Under existing PRC foreign exchange regulations, payments of current account items, including profit distributions, interest payments and trade and service-related foreign exchange transactions, can be made in foreign currencies without prior approval of State Administration of Foreign Exchange, or SAFE, by complying with certain procedural requirements. However, in practice sometimes payment of current account items may be subject to delay and other restrictions. Furthermore, approval from or registration with appropriate government authorities is required where Renminbi is to be converted into foreign currency and remitted out of China to pay capital expenses such as the repayment of loans denominated in foreign currencies.

In light of the flood of capital outflows of China in 2016 due to the weakening Renminbi, the PRC government has imposed more restrictive foreign exchange policies and stepped up scrutiny of major outbound capital movement including overseas direct investment.

More restrictions and substantial vetting process are put in place by SAFE to regulate cross-border transactions falling under the capital account. The PRC government may at its discretion further restrict access in the future to foreign currencies for current account transactions. Therefore, if we receive revenues in Renminbi by our proposed wholly foreign owned entity or otherwise, due to China's foreign exchange control, such revenues may not be converted to foreign currency and remitted out of China in a timely manner.

Risks relating to owning our common stock

The market price of our common stock is likely to be volatile and could fluctuate or decline, resulting in a substantial loss of your investment.

The market price of our common stock could be subject to wide fluctuations in response to, among other things, the factors described in this "Risk factors" section or otherwise, and other factors beyond our control, such as fluctuations in the valuations of companies perceived by investors to be comparable to us.

Furthermore, the stock markets have experienced price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations often have been unrelated or disproportionate to the operating performance of those companies. These broad market fluctuations, as well as general economic, systemic, political and market conditions, such as recessions, interest rate changes or international currency fluctuations, may negatively affect the market price of our common stock.

Factors that could cause the market price of our common stock to fluctuate significantly include:

- actual or anticipated fluctuations in our financial condition and operating results, including fluctuations in our quarterly and annual results;
- announcements of technological innovations by us or our competitors;
- overall conditions in our industry and the markets in which we operate;
- addition or loss of significant customers, or other developments with respect to significant customers;
- changes in laws or regulations applicable to our products;
- actual or anticipated changes in our growth rate relative to our competitors;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- additions or departures of key personnel;
- competition from existing products or new products that may emerge;
- issuance of new or updated research or reports by securities analysts;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- disputes or other developments related to proprietary rights, including patents, litigation matters including the Agilent litigation, and our ability to obtain intellectual property protection for our technologies;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us or our stockholders;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- the expiration of contractual lock-up agreements with our executive officers, directors and stockholders; and
- general economic and market conditions.

In the past, many companies that have experienced volatility in the market price of their stock have become subject to securities class action litigation. We may be the target of this type of litigation in the future. Securities litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could harm our business.

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

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

Future sales and issuances of our common stock or rights to purchase common stock, including pursuant to our equity incentive plans, could result in additional dilution of the percentage ownership of our stockholders and could cause the stock price of our common stock to decline.

In the future, we may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner, we determine from time to time. We also expect to issue common stock to employees and directors pursuant to our equity incentive plans. If we sell common stock, convertible securities or other equity securities in subsequent transactions, or common stock is issued pursuant to equity incentive plans, investors may be materially diluted. New investors in such subsequent transactions could gain rights, preferences and privileges senior to those of holders of our common stock.

Sales of a substantial number of shares of our common stock in the public market, or the perception these sales might occur, could cause our stock price to decline.

Sales of a substantial number of shares of our common stock in the public market, or the perception these sales might occur, could cause the market price of our common stock to decline and could impair our ability to raise capital through the sale of additional equity securities. As of December 31, 2018, we had 28,012,874 shares of common stock outstanding (on an as-converted basis), 5,750,000 of which were freely tradable.

The holders of an aggregate of 21,110,264 shares of our common stock as of December 31, 2018, have rights, subject to certain conditions, to require us to file registration statements covering their shares or to include their shares in registration statements we may file for ourselves or our stockholders. We have registered shares of common stock which we may issue under our 2018 Equity Incentive Plan and 2018 Employee Stock Purchase Plan and they may be sold freely in the public market upon issuance.

We may issue our shares of common stock or securities convertible into our common stock from time to time in connection with a financing, acquisition, and investments or otherwise. Any such issuance could result in substantial dilution to our existing stockholders and cause the trading price of our common stock to decline.

We have never paid dividends on our capital stock and we do not intend to pay dividends for the foreseeable future. Consequently, any gains from an investment in our common stock will likely depend on whether the price of our common stock increases.

We have never declared or paid any dividends on our common stock and do not intend to pay any dividends in the foreseeable future. We anticipate that we will retain all of our future earnings for use in the operation of our business and for general corporate purposes. Any determination to pay dividends in the future will be at the discretion of our board of directors. Accordingly, investors must rely on sales of their common stock after price appreciation, which may never occur, as the only way to realize any future gains on their investments. Furthermore, we are party to a credit agreement with Silicon Valley Bank which contains negative covenants that limit our ability to pay dividends. For more information, see the section of this Form 10-Q captioned "Management's discussion and analysis of financial condition and results of operation—Liquidity and capital resources." For more information regarding the negative covenants in our loan and security agreement with Silicon Valley Bank, see "Risk factors—Our credit facility contains restrictions that limit our flexibility in operating our business."

Our charter documents and Delaware law could prevent a takeover that stockholders consider favorable and could also reduce the market price of our stock.

Our amended and restated certificate of incorporation and our amended and restated bylaws will contain provisions that could delay or prevent a change in control of our company. These provisions could also make it more difficult for stockholders to elect directors and take other corporate actions. These provisions include:

- providing for a classified board of directors with staggered, three-year terms;
- authorizing our board of directors to issue preferred stock with voting or other rights or preferences that could discourage a takeover attempt or delay changes in control;
- prohibiting cumulative voting in the election of directors;
- providing that vacancies on our board of directors may be filled only by a majority of directors then in office, even though less than a quorum;
- prohibiting the adoption, amendment or repeal of our amended and restated bylaws or the repeal of the provisions of our amended and restated certificate of incorporation regarding the election and removal of directors without the required approval of at least 66.67% of the shares entitled to vote at an election of directors;
- prohibiting stockholder action by written consent;
- limiting the persons who may call special meetings of stockholders; and
- requiring advance notification of stockholder nominations and proposals.

These provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors, which is responsible for appointing the members of our management. In addition, the provisions of Section 203 of the Delaware General Corporate Law, or the DGCL, govern us. These provisions may prohibit large stockholders, in particular those owning 15% or more of our outstanding voting stock, from merging or combining with us for a certain period of time without the consent of our board of directors.

These and other provisions in our amended and restated certificate of incorporation and our amended and restated bylaws and under Delaware law could discourage potential takeover attempts, reduce the price investors might be willing to pay in the future for shares of our common stock and result in the market price of our common stock being lower than it would be without these provisions.

Insiders have substantial control over us and will be able to influence corporate matters.

As of December 12, 2018, our directors and executive officers and their affiliates beneficially own, in the aggregate, approximately 29.8% of our outstanding capital stock. As a result, these stockholders will be able to exercise significant influence over all matters requiring stockholder approval, including the election of directors and approval of significant corporate transactions, such as a merger or other sale of our company or its assets. This concentration of ownership could limit stockholders' ability to influence corporate matters and may have the effect of delaying or preventing a third party from acquiring control over us.

Claims for indemnification by our directors and officers may reduce our available funds to satisfy successful third-party claims against us and may reduce the amount of money available to us.

Our amended and restated certificate of incorporation and amended and restated bylaws provide that we will indemnify our directors and officers, in each case to the fullest extent permitted by Delaware law.

In addition, as permitted by Section 145 of the DGCL, our amended and restated bylaws and our indemnification agreements that we have entered into with our directors and officers provide that:

- We will indemnify our directors and officers for serving us in those capacities or for serving other business enterprises at our request, to the fullest extent permitted by Delaware law. Delaware law provides that a corporation may indemnify such person if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the registrant and, with respect to any criminal proceeding, had no reasonable cause to believe such person's conduct was unlawful;
- We may, in our discretion, indemnify employees and agents in those circumstances where indemnification is permitted by applicable law;
- We are required to advance expenses, as incurred, to our directors and officers in connection with defending a proceeding, except that such directors or officers shall undertake to repay such advances if it is ultimately determined that such person is not entitled to indemnification;
- We will not be obligated pursuant to our amended and restated bylaws to indemnify a person with respect to proceedings initiated by that person against us or our other indemnitees, except with respect to proceedings authorized by our board of directors or brought to enforce a right to indemnification;
- The rights conferred in our amended and restated bylaws are not exclusive, and we are authorized to enter into indemnification agreements with our directors, officers, employees and agents and to obtain insurance to indemnify such persons; and
- We may not retroactively amend our amended and restated bylaw provisions to reduce our indemnification obligations to directors, officers, employees and agents.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware and the federal district courts of the United States will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or other employees.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware is the sole and exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a breach of fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, any action asserting a claim against us arising pursuant to any provisions of the DGCL, our amended and restated certificate of incorporation or our amended and restated bylaws, any action or proceeding asserting a claim as to which the Delaware General Corporation Law confers jurisdiction upon the Court of Chancery of the State of Delaware or any action asserting a claim against us that is governed by the internal affairs doctrine, subject in each case to the Court of Chancery having personal jurisdiction over the parties named as defendants therein. The choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. If a court were to find the choice of forum provision contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions.

Our amended and restated certificate of incorporation further provides that the federal district courts of the United States will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act.

Item 2. ***Unregistered sales of equity securities and use of proceeds***

Sales of unregistered securities

During the three months ended December 31, 2018, we issued and sold the following unregistered securities:

- From December 1, 2018 to October 31, 2018, we issued stock options to certain of our service providers, executive officers and directors to purchase an aggregate of 45,334 shares of the Company's common stock under the 2013 Plan and 2018 Plan, with exercise prices ranging from $14.00 to $15.00 per share. No consideration was received for such stock options.

The sales of the above securities were exempt from registration under the Securities Act in reliance upon one or more of Sections 4(a)(2) or 3(a)(9) of the Securities Act, and Regulation D, Regulation S or Rule 701 under the Securities Act as transactions by an issuer in a private offering to certain types of investors, in exempt exchange transactions, in an offshore transaction, or pursuant to benefit plans and contracts relating to compensation, in each case as provided in the applicable statutes, rules and regulations.

Use of proceeds from public offering of common stock.

On October 30, 2018, our registration statement on Form S-1 (Registration No. 333-227672) was declared effective by the SEC for our initial public offering pursuant to which we registered an aggregate of 5,000,000 shares of our common stock at an initial public offering price of $14.00 per share for an aggregate price of $70.0 million. Sale on an additional 750,000 shares were registered upon exercise of the underwriters' over-allotment option at an offering price of $14.00 per share for an aggregate price of approximately $10.5 million. The underwriters of the offering were J.P. Morgan Securities LLC, Cowen and Company, LLC, Allen & Company LLC and Robert W. Baird & Co Incorporated. We paid the underwriters of our initial public offering an underwriting discount and commission totaling $5.6 million, in addition, we incurred $5.3 million in offering costs. Thus, the net offering proceeds, after deducting underwriting discounts and offering expenses, were approximately $69.6 million.

We intend to use the net proceeds from this offering primarily to (i) improve and update our platform and core technologies, (ii) expand our sales and marketing capabilities in the U.S. and in other geographies, including China, (iii) continue to expand in the pharmaceutical biologics drug discovery and DNA data storage markets, (iv) establish our operations in China, and (v) for working capital and general corporate purposes. While we have no current agreements, commitments or understandings for any specific strategic acquisitions or in-licenses at this time, we may use a portion of the net proceeds for these purposes.

Item 3. ***Defaults upon senior securities***

None.

Item 4. ***Mine safety disclosures***

Not applicable.

Item 5. ***Other information***

None

Item 6. ***Exhibits***

Exhibit Number	Description	Filed / Furnished / Incorporated from Form	Incorporated by Reference from Exhibit Number	Date Filed
3.1	Amended and Restated Certificate of Incorporation	8-K	3.1	11/7/2018
3.2	Amended and Restated Bylaws	8-K	3.2	11/7/2018
4.1	Form of common stock certificate.	S-1/A	4.1	10/17/2018
4.2	**Reserved**			
4.3	Amended and Restated Registration Rights Agreement by and among Twist Bioscience Corporation and certain holders of its capital stock dated March 19, 2018	S-1/A	4.3	10/17/2018
4.4	Warrant to Purchase Stock by and between Twist Bioscience Corporation and Silicon Valley Bank, dated October 8, 2013.	S-1	4.4	10/3/2018
4.5	Warrant to Purchase Stock by and between Twist Bioscience Corporation and Silicon Valley Bank, dated September 2, 2014.	S-1	4.5	10/3/2018
4.6	Warrant to Purchase Stock by and between Twist Bioscience Corporation and Silicon Valley Bank, dated December 22, 2015.	S-1	4.6	10/3/2018
4.7	Warrant to Purchase Stock by and between Twist Bioscience Corporation and Silicon Valley Bank, dated March 28. 2016.	S-1	4.7	10/3/2018
4.8	Warrant to Purchase Common Stock by and between Twist Bioscience Corporation and Life Science Loans II, LLC. dated September 6, 2017.	S-1	4.8	10/3/2018
4.9	Warrant to Purchase Common Stock by and between Twist Bioscience Corporation and Silicon Valley Bank, dated September 6, 2017.	S-1	4.9	10/3/2018
10.1+	2013 Stock Plan and forms of agreement thereunder.	S-1	10.1	10/3/2018
10.2+	2018 Equity Incentive Plan and forms of agreement thereunder.	S-1/A	10.2	10/17/2018
10.3+	2018 Employee Stock Purchase Plan.	S-1/A	10.3	10/17/2018
10.4+	Executive Incentive Bonus Plan.	S-1	10.4	10/3/2018
10.5+	Amended and Restated Employment Agreement by and between Twist Bioscience Corporation and Emily M. Leproust.	S-1/A	10.5	10/26/2018
10.6+	Amended and Restated Employment Agreement by and between Twist Bioscience Corporation and James Thorburn.	S-1/A	10.6	10/26/2018
10.7+	Amended and Restated Employment Agreement by and between Twist Bioscience Corporation and Mark Daniels.	S-1/A	10.7	10/26/2018

Exhibit Number	Description	Filed / Furnished / Incorporated by Reference Form	Incorporated by Reference from Exhibit Number	Date Filed
10.8	Form of Indemnification Agreement between Twist Bioscience Corporation and each of its Officers and Directors.	S-1/A	10.8	10/17/2018
10.9	Fourth Amended and Restated Loan and Security Agreement by and between Twist Bioscience Corporation, Silicon Valley Bank and certain other co-borrowers, dated September 6, 2017.	S-1	10.9	10/3/2018
10.10	Lease Agreement by and between Twist Bioscience Corporation and ARE-San Francisco No. 19, LLC, dated July 26, 2013.	S-1	10.10	10/3/2018
10.10.1	First Amendment to Lease by and between Twist Bioscience Corporation and ARE-San Francisco No. 19, LLC, dated August 7, 2013.	S-1	10.10.1	10/3/2018
10.10.2	Second Amendment to Lease by and between Twist Bioscience Corporation and ARE-San Francisco No. 19, LLC. dated May 19, 2015.	S-1	10.10.2	10/3/2018
10.10.3	Third Amendment to Lease by and between Twist Bioscience Corporation and ARE-San Francisco No. 19, LLC, dated September 23, 2015.	S-1	10.10.3	10/3/2018
10.10.4	Fourth Amendment to Lease by and between Twist Bioscience Corporation and ARE-San Francisco No. 19, LLC, dated January 6, 2016.	S-1	10.10.4	10/3/2018
10.10.5	Fifth Amendment to Lease by and between Twist Bioscience Corporation and ARE-San Francisco No. 19, LLC, dated April 12, 2016.	S-1	10.10.5	10/3/2018
10.11	Lease Agreement by and between Twist Bioscience Corporation and ARE-San Francisco No. 32, LLC dated March 21, 2018.	S-1	10.11	10/3/2018
10.12	Sublease Agreement by and between Twist Bioscience Corporation and Blade Therapeutics, Inc., dated May 25, 2016.	S-1	10.12	10/3/2018
10.13*	Supply Agreement by and between Twist Bioscience Corporation and Ginkgo Bioworks, Inc., dated March 2, 2018.	S-1	10.13	10/3/2018
10.14*	End User Supply Agreement by and between Twist Bioscience Corporation and FUJIFILM Dimatix, Inc., dated November 5, 2015.	S-1	10.14	10/3/2018
31.1	Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002, Rule 13(a)-14(a)/15d-14(a), by President and Chief Executive Officer.	Filed herewith		
31.2	Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002, Rule 13(a)-14(a)/15d-14(a), by President and Chief Financial Officer.	Filed herewith		
32.1†	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, by President and Chief Executive Officer.	Furnished herewith		
32.2†	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, by President and Chief Executive Officer.	Furnished herewith		
101.INS	XBRL Instance Document	Filed herewith		
101.SCH	XBRL Taxonomy Extension Schema Document	Filed herewith		
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document	Filed herewith		
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	Filed herewith		
101.LAB	XBRL Taxonomy Extension Label Linkbase Document	Filed herewith		
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document	Filed herewith		

* Portions of this exhibit (indicated by asterisks) have been omitted pursuant to a request for confidential treatment that was separately filed with the SEC.

\+ Indicates a management contract or compensatory plan.

† The certifications attached as Exhibits 32.1 and 32.2 that accompany this Quarterly Report on Form 10-Q are not deemed filed with the SEC and are not to be incorporated by reference into any filing of Twist Bioscience Corporation. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Quarterly Report on Form 10-Q, regardless of any general incorporation language contained in any filing.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

February 11, 2019

Twist Bioscience Corporation

By: /s/ James M. Thorburn
James M. Thorburn
Chief Financial Officer

Exhibit 31.1

Certification of Principal Executive Officer
pursuant to
Exchange Act Rules 13a-14(a) and 15d-14(a),
as adopted pursuant to
Section 302 of the Sarbanes-Oxley Act of 2002

I, Emily M. Leproust, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Twist Bioscience Corporation for the quarter ended December 31, 2018;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (c) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ Emily M. Leproust
Emily M. Leproust
President and Chief Executive Officer

Date: February 11, 2019

Exhibit 31.2

Certification of Principal Financial Officer
pursuant to
Exchange Act Rules 13a-14(a) and 15d-14(a),
as adopted pursuant to
Section 302 of the Sarbanes-Oxley Act of 2002

I, James M. Thorburn, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Twist Bioscience Corporation for the quarter ended December 31, 2018;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (c) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ James M. Thorburn

James M. Thorburn
Chief Financial Officer

Date: February 11, 2019

Exhibit 32.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY
ACT OF 2002

In connection with the Quarterly Report of Twist Bioscience Corporation (the "Company") on Form 10-Q for the quarterly period ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Emily M. Leproust, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 11, 2019

/s/ Emily M. Leproust
Emily M. Leproust
President and Chief Executive Officer

Exhibit 32.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY
ACT OF 2002

In connection with the Quarterly Report of Twist Bioscience Corporation (the "Company") on Form 10-Q for the quarterly period ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, James M. Thorburn, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 11, 2019

/s/ James M. Thorburn
James M. Thorburn
Chief Financial Officer