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

FORM 10-Q

(Mark One)

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

For the quarterly period ended September 30, 2018

or

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

For the transition period from to

Commission file number: 001-34180

FLUIDIGM CORPORATION

(Exact name of registrant as specified in its charter)

Delaware	**77-0513190**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification Number)**

7000 Shoreline Court, Suite 100

South San Francisco, California 94080
(Address of principal executive offices) (Zip Code)
(650) 266-6000
(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 ý 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 during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ý No ¨
Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.
Large accelerated filer ¨ Accelerated filer ý

Non-accelerated filer ¨ Smaller reporting company ý

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. o
Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ¨ No ý
As of October 31, 2018, there were shares of the Registrant's common stock, $0.001 par value per share, outstanding.

FLUIDIGM CORPORATION
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PART I. FINANCIAL INFORMATION
Item 1. Financial Statements

FLUIDIGM CORPORATION
CONDENSED CONSOLIDATED BALANCE SHEETS
(In thousands, except per share amounts)
(Unaudited)

	September 30, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	$35,829	$58,056
Short-term investments	—	5,080
Accounts receivable (net of allowances of $31 at September 30, 2018 and $391 at December 31, 2017)	18,379	15,049
Inventories	15,424	15,088
Prepaid expenses and other current assets	2,228	1,528
Total current assets	71,860	94,801
Property and equipment, net	9,760	12,301
Other non-current assets	6,362	7,541
Developed technology, net	60,200	68,600
Goodwill	104,108	104,108
Total assets	$252,290	$287,351
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$6,246	$4,211
Accrued compensation and related benefits	14,526	10,535
Other accrued liabilities	6,582	8,490
Deferred revenue, current	11,511	10,238
Total current liabilities	38,865	33,474
Convertible notes, net	169,345	195,238
Deferred tax liability, net	13,790	16,919
Deferred revenue, non-current	5,705	4,960
Other non-current liabilities	2,173	5,825
Total liabilities	229,878	256,416
Commitments and contingencies (see Note 8)		
Stockholders' equity:		
Preferred stock, $0.001 par value, 10,000 shares authorized, no shares issued and outstanding at September 30, 2018 and December 31, 2017	—	—
Common stock, $0.001 par value, 200,000 shares authorized at September 30, 2018 and December 31, 2017; 39,316 and 38,787 shares issued and outstanding as of September 30, 2018 and December 31, 2017, respectively	39	39
Additional paid-in capital	566,964	531,666
Accumulated other comprehensive loss	(516)	(574)
Accumulated deficit	(544,075)	(500,196)
Total stockholders' equity	22,412	30,935
Total liabilities and stockholders' equity	$252,290	$287,351

See accompanying notes.

FLUIDIGM CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except per share amounts)
(Unaudited)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Revenue:				
Product revenue	$24,242	$20,576	$66,496	$61,383
Service revenue	4,721	4,133	14,143	12,620
License revenue	—	38	—	190
Total revenue	28,963	24,747	80,639	74,193
Costs and expenses:				
Cost of product revenue	11,635	11,414	33,017	33,060
Cost of service revenue	1,506	1,150	4,784	3,437
Research and development	7,430	7,683	22,072	23,668
Selling, general and administrative	20,020	20,102	57,812	63,653
Total costs and expenses	40,591	40,349	117,685	123,818
Loss from operations	(11,628)	(15,602)	(37,046)	(49,625)
Interest expense	(4,019)	(1,456)	(9,824)	(4,367)
Other income, net	117	379	465	571
Loss before income taxes	(15,530)	(16,679)	(46,405)	(53,421)
Income tax benefit	780	735	2,167	3,343
Net loss	$(14,750)	$(15,944)	$(44,238)	$(50,078)
Net loss per share, basic and diluted	$(0.38)	$(0.46)	$(1.13)	$(1.61)
Shares used in computing net loss per share, basic and diluted	39,235	34,513	39,033	31,051

See accompanying notes.

FLUIDIGM CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(In thousands)
(Unaudited)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Net loss	$(14,750)	$(15,944)	$(44,238)	$(50,078)
Other comprehensive income (loss), net of tax:				
Foreign currency translation adjustment	(11)	(85)	59	25
Net change in unrealized gain on investments	1	2	(1)	4
Other comprehensive income (loss), net of tax	(10)	(83)	58	29
Comprehensive loss	$(14,760)	$(16,027)	$(44,180)	$(50,049)

See accompanying notes.

FLUIDIGM CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)
(Unaudited)

	Nine Months Ended September 30,	
	2018	**2017**
Operating activities		
Net loss	$(44,238)	$(50,078)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	4,123	5,578
Stock-based compensation expense	6,057	7,097
Amortization of developed technology	8,400	8,400
Amortization of debt discounts, premium and issuance costs	5,715	242
Other non-cash items	40	(535)
Changes in assets and liabilities:		
Accounts receivable, net	(3,285)	751
Inventories	(820)	2,102
Prepaid expenses and other current assets	(540)	182
Other non-current assets	622	1,417
Accounts payable	2,054	1,079
Deferred revenue	2,053	908
Other current liabilities	2,035	687
Other non-current liabilities	(6,779)	(2,589)
Net cash used in operating activities	(24,563)	(24,759)
Investing activities		
Purchases of investments	(1,451)	(1,450)
Proceeds from sales and maturities of investments	6,541	24,375
Purchases of property and equipment	(352)	(1,388)
Net cash provided by investing activities	4,738	21,537
Financing activities		
Payment of debt issuance costs	(2,779)	—
Net proceeds from issuance of common stock	562	28,843
Proceeds from exercise of stock options	25	63
Payments for taxes related to net share settlement of equity awards	(100)	(90)
Net cash provided by (used in) financing activities	(2,292)	28,816
Effect of foreign exchange rate fluctuations on cash and cash equivalents	(110)	305
Net (decrease) / increase in cash and cash equivalents	(22,227)	25,899
Cash and cash equivalents at beginning of period	58,056	35,045
Cash and cash equivalents at end of period	$35,829	$60,944

See accompanying notes.

FLUIDIGM CORPORATION
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(Unaudited)

1. Description of Business

Fluidigm Corporation (we, our, or us) was incorporated in the State of California in May 1999, to commercialize microfluidic technology initially developed at the California Institute of Technology. In July 2007, we were reincorporated in Delaware. Our headquarters are located in South San Francisco, California.

We create, manufacture, and market innovative technologies and tools for life sciences research. We sell instruments and consumables, including integrated fluidic circuits, or IFCs, assays and reagents to academic institutions, clinical research laboratories, and biopharmaceutical, biotechnology, and agricultural biotechnology, or Ag-Bio, companies and contract research organizations, or CROs. Our technologies and tools are directed at the analysis of deoxyribonucleic acid, or DNA, ribonucleic acid, or RNA, and proteins in a variety of different sample types, from individual cells to bulk tissue.

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles (U.S. GAAP), and following the requirements of the Securities and Exchange Commission (SEC) for interim reporting. As permitted under those rules, certain footnotes or other financial information that are normally required by U.S. GAAP have been condensed or omitted, and accordingly the balance sheet as of December 31, 2017, has been derived from audited consolidated financial statements at that date but does not include all disclosures required by U.S. GAAP for complete financial statements. These financial statements have been prepared on the same basis as our annual financial statements and, in the opinion of management, reflect all adjustments (consisting only of normal recurring adjustments) that are necessary for a fair statement of our financial information. The results of operations for the three and nine months ended September 30, 2018 are not necessarily indicative of the results to be expected for the year ending December 31, 2018, or for any other interim period or for any other future year. All intercompany transactions and balances have been eliminated in consolidation.

The preparation of these condensed consolidated financial statements requires management to make estimates and assumptions that affect the amounts reported in the condensed consolidated financial statements and accompanying notes. We base our estimates on historical experience and on various other assumptions believed to be reasonable, which together form the basis for making judgments about the carrying values of assets and liabilities. Actual results could differ materially from these estimates and could have a material adverse effect on our condensed consolidated financial statements.

The accompanying condensed consolidated financial statements and related financial information should be read in conjunction with the audited consolidated financial statements and the accompanying notes in Item 8 of Part II, "Financial Statements and Supplementary Data," for the year ended December 31, 2017, included in our Annual Report on Form 10-K.

Certain prior period amounts in the condensed consolidated statements of cash flows have been reclassified to conform to the current period presentation. These reclassifications were immaterial and did not affect prior period

total assets, total liabilities, stockholders' equity, total revenue, total costs and expenses, loss from operations or net loss.

Net Loss per Share

Our basic and diluted net loss per share is calculated by dividing net loss by the weighted-average number of shares of common stock outstanding for the period. Restricted stock units, options to purchase common stock, and shares associated with the potential conversion of our convertible notes are considered to be potentially dilutive common shares but have been excluded from the calculation of diluted net loss per share as their effect is anti-dilutive for all periods presented.

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The following potentially dilutive common shares were excluded from the computation of diluted net loss per share for the three and nine months ended September 30, 2018, and 2017 because including them would have been anti-dilutive (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Stock options, restricted stock units and performance awards	4,376	3,742	4,376	3,742
2018 Convertible Notes	19,036	—	19,036	—
2018 Convertible Notes potential make-whole shares at September 30, 2018	799	—	799	—
2014 Convertible Notes	916	3,598	916	3,598
Total	25,127	7,340	25,127	7,340

Accumulated Other Comprehensive Loss

The components of accumulated other comprehensive loss, net of tax, for the three and nine months ended September 30, 2018, are as follows (in thousands):

	Foreign Currency Translation Adjustment	Net Unrealized Gain on Securities	Accumulated Other Comprehensive Loss
Balance at December 31, 2017	$ (575)	$ 1	$ (574)
Other comprehensive income (loss)	43	(1)	42
Balance at March 31, 2018	(532)	—	(532)
Other comprehensive income	26	2	28
Balance at June 30, 2018	$ (506)	$ 2	$ (504)
Other comprehensive (loss)	(10)	$ (2)	(12)
Balance at September 30, 2018	$ (516)	$ —	$ (516)

Immaterial amounts of unrealized gains and losses have been reclassified into the condensed consolidated statement of operations for the three and nine months ended September 30, 2018.

Goodwill, Intangible Assets, and Other Long-lived Assets

Goodwill and intangible assets with indefinite lives are not subject to amortization but are tested for impairment on an annual basis during the fourth quarter or whenever events or changes in circumstances indicate the carrying amount of these assets may not be recoverable. We first assess qualitative factors to determine whether it is more likely than not that the fair value of our reporting unit is less than its carrying amount. If we determine that it is more likely than not that the fair value of our reporting unit is less than its carrying amount, we then conduct a two-step test for impairment of goodwill. In the first step, we compare the fair value of our reporting unit to its carrying value. If the fair value of our reporting unit exceeds its carrying value, goodwill is not considered impaired and no further analysis is required. If the carrying value of the reporting unit exceeds its fair value, then the second step of the impairment test must be performed in order to determine the implied fair value of the goodwill. If the carrying value of the goodwill exceeds

its implied fair value, then an impairment loss equal to the difference would be recorded.

We evaluate our finite-lived intangible assets and other long-lived assets for indicators of possible impairment when events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. If any indicator of impairment exists, we assess the recoverability of the affected asset by determining whether the carrying value of the asset can be recovered through undiscounted future operating cash flows. If impairment is indicated, we estimate the asset's fair value using future discounted cash flows associated with the use of the asset and adjust the carrying value of the asset accordingly.

Convertible Notes

In February 2014, we closed an underwritten public offering $201.3 million aggregate principal amount of our 2.75% Senior Convertible Notes due 2034 (2014 Notes). In March 2018, we entered into separate privately negotiated transactions

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with certain holders of our 2014 Notes to exchange $150.0 million in aggregate principal amount of the 2014 Notes for our new 2.75% Exchange Convertible Senior Notes due 2034 (2018 Notes).

Following the exchange, approximately $51.3 million in aggregate principal amount of the 2014 Notes remain outstanding in addition to $150.0 million in aggregate principal amount of the 2018 Notes.

See Footnote 4. Convertible Notes and Credit Facility for the accounting treatment of the transaction and additional information about the exchange.

Recent Accounting Changes and Accounting Pronouncements

Adoption of New Accounting Guidance

In May 2014, the FASB issued ASU 2014-09 Revenue from Contracts with Customers (Topic 606). Topic 606 and its related amendments supersede Revenue Recognition (Topic 605), issued in June 2010, and provide principles for recognizing revenue for goods and services in a manner consistent with the transfer of control of those goods and services to the customer.

We adopted Topic 606 on January 1, 2018, using the modified retrospective method applied to those contracts with unrecognized revenue on the adoption date. We recognized the effect of applying the new revenue standard by recording a cumulative catch-up adjustment that reduced the accumulated deficit component of stockholders' equity by $0.4 million and increased current assets by $0.2 million and non-current assets by $0.2 million. The adjustment capitalized certain sales commission costs that were incurred to obtain instrument service contracts. Under Topic 605, we accounted for these incremental contract acquisition costs by recognizing them as expense at the point the contract was awarded. Under Topic 606, the costs are capitalized and amortized to expense over the life of the contract, which is generally one to three years. The comparative information for periods prior to January 1, 2018, has not been restated and continues to be reported in accordance with Topic 605.

The following table summarizes the cumulative effect of adopting Topic 606 on amounts previously reported in our consolidated balance sheet at December 31, 2017 (in thousands):

	Balance at December 31, 2017	Topic 606 Transition Adjustments	Balance at January 1, 2018
Prepaid expenses and other current assets	$1,528	$ 153	$1,681
Total current assets	$94,801	$ 153	$94,954
Other non-current assets	$7,541	$ 205	$7,746
Total assets	$287,351	$ 358	$287,709
Accumulated deficit	$(500,196)	$ 358	$(499,838)
Total stockholders' equity	$30,935	$ 358	$31,293
Total liabilities and stockholders' equity	$287,351	$ 358	$287,709

The following table summarizes the impacts on our condensed consolidated statements of operations of adopting Topic 606 compared to Topic 605 for the three and nine months ended September 30, 2018 (in thousands):

	As Reported	Balance Without Adoption of Topic 606	Effect of Change	As Reported	Balance Without Adoption of Topic 606	Effect of Change
	Three Months Ended September 30, 2018			Nine Months Ended September 30, 2018		
Selling, general and administrative	$20,020	$20,035	$(15)	$57,812	$57,877	$(65)
Total costs and expenses	$40,591	$40,606	$(15)	$117,685	$117,750	$(65)
Loss from operations	$(11,628)	$(11,643)	$15	$(37,046)	$(37,111)	$65
Loss before income taxes	$(15,530)	$(15,545)	$15	$(46,405)	$(46,470)	$65
Net loss	$(14,750)	$(14,765)	$15	$(44,238)	$(44,303)	$65

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The following table summarizes the impacts on our condensed consolidated balance sheets of adopting Topic 606 compared to Topic 605 at September 30, 2018 (in thousands):

	As Reported	Balance Without Adoption of Topic 606	Effect of Change
		September 30, 2018	
Prepaid expenses and other current assets	$2,228	$ 2,056	$ 172
Total current assets	$71,860	$ 71,688	$ 172
Other non-current assets	$6,362	$ 6,111	$ 251
Total assets	$252,290	$ 251,867	$ 423
Stockholders' equity	$22,412	$ 21,989	$ 423
Total liabilities and stockholders' equity	$252,290	$ 251,867	$ 423

In August 2016, the FASB issued ASU 2016-15 Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments. The ASU addresses eight specific cash flow issues and their presentation within the statement of cash flows. We adopted this ASU in the first quarter of 2018. The adoption of this ASU did not have a material impact on our condensed consolidated financial statements.

In November 2016, the FASB issued ASU 2016-18 Statement of Cash Flows (Topic 230): Restricted Cash, a consensus of the FASB’s Emerging Issues Task Force, amending the presentation of restricted cash within the statement of cash flows. The new guidance requires that restricted cash be included within cash and cash equivalents on the statement of cash flows. We adopted this ASU in the first quarter of 2018. The adoption of this ASU did not have a material impact on our condensed consolidated financial statements.

Recent Accounting Pronouncements

In February 2016, the FASB issued ASU 2016-02 Leases (Topic 842). This ASU requires lessees to recognize a right-of-use asset and a lease liability on the balance sheet for all leases except short-term leases. For lessees, leases will continue to be classified as either operating or finance leases in the income statement. Lessor accounting under this ASU is similar to the current model but updated to align with certain changes to the lessee model. Lessors will continue to classify leases as operating, direct financing or sales-type leases. ASU 2016-02 will be effective for our fiscal year beginning January 1, 2019, and early adoption is permitted. During the third quarter of 2018, the FASB provided a practical expedient transition method
to adopt the new lease requirements by allowing companies to recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption that would enable us to not provide comparative period financial statements. Instead, we would apply the transition provisions at its effective date. The Company will adopt the new standard on January 1, 2019. The Company has developed a project plan and we are in the process of reviewing our lease portfolio, analyzing the potential accounting impact and determining the use of practical expedients upon adoption.

In January 2017, the FASB issued ASU 2017-04, Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment. The ASU eliminates the requirement for an entity to calculate the implied fair value of goodwill to measure a goodwill impairment charge. Instead, an entity performs its annual, or interim, goodwill impairment testing by comparing the fair value of a reporting unit with its carrying amount and recording an impairment charge for the amount by which the carrying amount exceeds the fair value. The ASU will be effective for annual and interim goodwill impairment testing performed for our fiscal year beginning January 1, 2020, with early adoption permitted. We are currently evaluating the effect that the updated standard will have on our consolidated financial statements.

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In February 2018, the FASB issued ASU 2018-02 Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income. This ASU amends the reporting of comprehensive income to allow a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act (the Tax Act). The Tax Act was enacted in December 2017 and
reduced the U.S federal corporate income tax rate and made other changes to U.S. federal tax law. ASU 2018-02 will be effective for our fiscal year beginning January 1, 2019, and early adoption is permitted. We are currently evaluating the accounting, transition, and disclosure requirements of the standard. We are currently evaluating the effect that the updated standard will have on our consolidated financial statements.

In March 2018, the FASB issued ASU No. 2018-05, Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118. This ASU allows SEC reporting companies to record provisional amounts in earnings for the year ended December 31, 2017, due to the complexities involved in accounting for the enactment of the Tax Act. The Company recognized the estimated income tax effects of the Tax Act in its 2017 Consolidated Financial Statements in accordance with SEC Staff Accounting Bulletin No. 118 (“SAB No. 118”). Refer to Note 10 for further information regarding the provisional amounts recorded by the Company as of December 31, 2017.

3. Revenue

We generate revenue primarily from the sale of our products and services. Product revenue is derived from the sale of instruments and consumables, including IFCs, assays and reagents. Service revenue is derived from the sale of instrument service contracts, repairs, installation, training and other specialized product support services.

Revenue is reported net of any sales, use and value-added taxes we collect from customers as required by government authorities.

We recognize revenue based on the amount of consideration we expect to receive in exchange for the goods and services we transfer to the customer. Our commercial arrangements typically include multiple distinct products and services, and we allocate revenue to these performance obligations based on their relative standalone selling prices. Standalone selling prices ("SSP") are generally determined using observable data from recent transactions. In cases where sufficient data is not available, we estimate a product’s SSP using a cost plus a margin approach or by applying a discount to the product’s list price.

Product Revenue

We recognize product revenue at the point in time when control of the goods passes to the customer and we have an enforceable right to payment. This generally occurs either when the product is shipped from one of our facilities or when it arrives at the customer’s facility, based on the contractual terms.

Customers generally do not have a unilateral right to return products after delivery. Instruments are sold with an assurance-type warranty and the estimated cost of the warranty is recognized as expense at the point when revenue is

recognized. Invoices are generally issued at shipment and become due in 30 to 60 days.

We sometimes perform shipping and handling activities after control of the product passes to the customer. We have made an accounting policy election to account for these activities as product fulfillment activities rather than as separate performance obligations.

Service Revenue

We recognize revenue from repairs, installation, training and other specialized product support services at the point in time the work is completed. Installation and training services are generally billed in advance of service. Repairs and other services are generally billed at the point the work is completed.

Revenue associated with instrument service contracts is recognized ratably over the life of the agreement, which is generally one to three years. We believe this time-elapsed approach is appropriate for service contracts because we provide services on demand throughout the term of the agreement. Invoices are generally issued in advance of service on a monthly, quarterly, annual or multi-year basis. Payments made in advance of service are reported on our consolidated balance sheet as deferred revenue.

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Performance Obligations

We reported $15.2 million of deferred revenue on our December 31, 2017 consolidated balance sheet. During the three months ended September 30, 2018, $3.5 million of the opening balance was recognized as revenue and $6.1 million of net additional advance payments were received from customers, primarily associated with instrument service contracts. During the nine months ended September 30, 2018, $9.8 million of the opening balance was recognized as revenue and $15.5 million of net additional advance payments were received from customers, primarily associated with instrument service contracts. At September 30, 2018, we reported $17.2 million of deferred revenue.

The following table summarizes the expected timing of revenue recognition for unfulfilled performance obligations associated with instrument service contracts that were partially completed at September 30, 2018 (in thousands):

Fiscal Year	Expected Revenue [1]
2018 (remainder of the year)	$3,450
2019	7,979
2020	4,240
Thereafter	2,673
Total	$18,342

[1] Expected revenue includes both billed amounts included in deferred revenue and unbilled amounts that are not reflected in our consolidated financial statements and are subject to change if our customers decide to cancel or modify their contracts. Purchase orders for instrument service contracts can generally be canceled before the service period begins without penalty.

We apply the practical expedient that permits us to not disclose information about unsatisfied performance obligations that are expected to be delivered within one year.

Contract Costs

Incremental sales commission costs incurred to obtain instrument service contracts are capitalized and amortized to selling, general and administrative expense over the life of the contract, which is generally one to three years. As a practical expedient, we expense sales commissions associated with product support services that are delivered in less than one year as they are incurred. Sales commissions associated with the sale of products are expensed as they are incurred.

We reported $0.4 million of capitalized commission costs from instrument service contracts on our December 31, 2017 and September 30, 2018, condensed consolidated balance sheets. Additional costs capitalized during the three and nine months ended September 30, 2018, net of amortization, was not material.

Significant Judgments

Applying the revenue recognition practices discussed above often requires significant judgment. Assessing collectability requires us to determine if the customer has the ability and intent to make payments. This requires a comprehensive review of all relevant facts, including the customer's historical practices and current financial condition. Estimating the amount of our future warranty obligations requires judgment. If warranty claims or the cost of servicing our products under warranty exceed our estimates, our cost of revenues could be adversely affected in future periods. Judgment is required when identifying performance obligations, estimating SSP and allocating purchasing consideration in multi-element arrangements. Moreover, significant judgment is required when interpreting commercial terms and determining when control of goods and services passes to the customer. Any material changes created by errors in judgment could have a material effect on our operating results and overall financial condition.

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Disaggregation of Revenues

The following table disaggregates our revenue for the three and nine months ended September 30, 2018, and 2017, respectively, by geographic area and by products and services (in thousands):

	Three Months Ended September 30,		Year Over Year	Nine Months Ended September 30,		Year Over Year
	2018	2017	Change	2018	2017	Change
Geographic Markets:						
United States	$13,233	$11,154	$2,079	$35,391	$34,659	$732
Europe	8,783	7,711	1,072	26,365	23,095	3,270
Asia Pacific	6,526	4,857	1,669	17,266	13,710	3,556
Other	421	1,025	(604)	1,617	2,729	(1,112)
Total revenue	$28,963	$24,747	$4,216	$80,639	$74,193	$6,446
Products and Services:						
Instruments	$13,890	$10,518	$3,372	$31,831	$31,183	$648
Consumables	10,352	10,058	294	34,665	30,200	4,465
Product revenue	24,242	20,576	3,666	66,496	61,383	5,113
Services	4,721	4,133	588	14,143	12,620	1,523
License	—	38	(38)	—	190	(190)
Total revenue	$28,963	$24,747	$4,216	$80,639	$74,193	$6,446

4. Convertible Notes and Credit Facility

2014 Senior Convertible Notes (2014 Notes)

On February 4, 2014, we closed an underwritten public offering of $201.3 million aggregate principal amount of our 2.75% Senior Convertible Notes due 2034 (2014 Notes), pursuant to an underwriting agreement dated January 29, 2014. The 2014 Notes accrue interest at a rate of 2.75% per year, payable semi-annually in arrears on February 1 and August 1 of each year. Interest on the 2014 Notes accrued from February 4, 2014. The 2014 Notes will mature on February 1, 2034, unless earlier converted, redeemed, or repurchased in accordance with the terms of the 2014 Notes.

The initial conversion rate of the 2014 Notes is 17.8750 shares of our common stock, par value $0.001 per share, per $1,000 principal amount of 2014 Notes (which is equivalent to an initial conversion price of approximately $55.94 per share). The conversion rate will be subject to adjustment upon the occurrence of certain specified events, including upon a conversion in connection with a fundamental change, as defined in the indenture governing the 2014 Notes or, subject to certain conditions, redemption of the 2014 Notes by the Company.

Holders may surrender their 2014 Notes for conversion at any time prior to the stated maturity date. On or after February 6, 2018, and prior to February 6, 2021, we may redeem any or all of the 2014 Notes in cash if the closing price of our common stock exceeds 130% of the conversion price for a specified number of days, and on or after February 6, 2021, we may redeem any or all of the 2014 Notes in cash without any such condition. The redemption price of the 2014 Notes will equal 100% of the principal amount of the 2014 Notes plus accrued and unpaid interest. Holders may require us to repurchase all or a portion of their 2014 Notes on each of February 6, 2021, February 6, 2024, and February 6, 2029, at a repurchase price in cash equal to 100% of the principal amount of the 2014 Notes plus accrued and unpaid interest. If we undergo a fundamental change, as defined in the indenture governing the 2014 Notes, holders may require us to repurchase the 2014 Notes in whole or in part for cash at a repurchase price equal to 100% of the principal amount of the 2014 Notes plus accrued and unpaid interest.

In February 2014, we received $195.2 million, net of underwriting discounts, from the issuance of the 2014 Notes and incurred approximately $1.1 million in offering-related expenses. The underwriting discount of $6.0 million and the debt issuance costs of $1.1 million were recorded as offsets to the proceeds.

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2018 Senior Convertible Notes (2018 Notes)

In March 2018, we entered into separate privately negotiated transactions with certain holders of our 2014 Notes to exchange $150.0 million in aggregate principal amount of the 2014 Notes for new convertible notes (2018 Notes). As of the closing of the 2018 Notes on March 12, 2018, the estimated fair value was $145.5 million. The difference between the $150.0 million aggregate principal amount of the 2018 Notes and its fair value will be amortized over the expected term of the 2018 Notes using the effective interest method through the first note holder put date of February 6, 2023.

We accounted for the exchange transaction as an extinguishment of debt due to the significance of the change in value of the embedded conversion option, resulting in a $0.1 million gain. The gain on extinguishment of debt was calculated as the difference between the reacquisition price (i.e., the fair value of the principal amount of 2018 Notes) and the net carrying value of the 2014 Notes exchanged net of unamortized debt discount and debt issuance cost write-offs.

The 2018 Notes accrue interest at a rate of 2.75%, payable semi-annually in arrears on February 1 and August 1 of each year. Interest on the 2018 Notes will accrue from February 1, 2018. The 2018 Notes will mature on February 1, 2034, unless earlier converted, redeemed, or repurchased in accordance with the terms of the indenture governing the 2018 Notes. The initial conversion rate of the 2018 Notes is 126.9438 shares of our common stock, par value $0.001 per share, per $1,000 principal amount of the 2018 Notes (which is equivalent to an initial conversion price of approximately $7.88 per share). The conversion rate will be subject to adjustment upon the occurrence of certain specified events. Those certain specified events include Holders who convert their 2018 Notes voluntarily prior to our exercise of the Issuer's Conversion Option or in connection with a make-whole fundamental change prior to February 6, 2023, are entitled, under certain circumstances, to a make-whole premium in the form of an increase in the conversion rate determined by reference to a make-whole table set forth in the indenture governing the 2018 Notes. Any time prior to the maturity of the 2018 Notes, we may convert the 2018 Notes, in whole but not in part, into cash, shares of our common stock, or combination thereof, if the closing price of our common stock equals or exceeds 110% of the conversion price then in effect for a specified number of days (Issuer’s Conversion Option). On or after February 6, 2022, we may elect to redeem all or any portion of the 2018 Notes at a redemption price equal to 100% of the accreted principal amount of the 2018 Notes on the redemption date of the 2018 Notes, plus accrued and unpaid interest.

Holders of the 2018 Notes have the right, at their option, to require us to purchase all or a portion of the 2018 Notes (i) on February 6, 2023, February 6, 2026, and February 6, 2029, or (ii) in the event of a fundamental change, as defined in the indenture governing the 2018 Notes, in each case, at a repurchase price equal to 100% of the accreted principal amount (i.e., up to 120% of the outstanding principal amount) of the 2018 Notes on the fundamental change repurchase date, plus accrued and unpaid interest.

As the 2018 Notes are convertible, at our election, into cash, shares of our common stock, or a combination of cash and shares of our common stock, we accounted for the 2018 Notes under the cash conversion guidance in ASC 470, whereby the embedded conversion option in the 2018 Notes was separated and accounted for in equity. The embedded conversion option value was calculated as the difference between (i) the total fair value of the 2018 Notes and (ii) the

fair value of a similar debt instrument excluding the embedded conversion option. We determined an embedded conversion option value of $29.3 million, which was recorded in additional paid-in-capital and reduced the carrying value of the 2018 Notes. The resulting discount on the 2018 Notes will be amortized over the expected term of the 2018 Notes, using the effective interest method through the first note holder put date, of February 6, 2023.

Offering-related costs for the 2018 Notes were approximately $2.8 million and were paid in the first and second quarters of 2018. Offering-related costs of $2.2 million were capitalized as debt issuance costs, recorded as an offset to the carrying value of the 2018 Notes, and will be amortized over the expected term of the 2018 Notes using the effective interest method through the first note holder put date of February 6, 2023. Offering-related costs of $0.6 million were accounted for as equity issuance costs, recorded as an offset to additional paid-in capital, and are not subject to amortization. Offering-related costs were allocated between debt and equity in the same proportion as the allocation of the 2018 Notes between debt and equity.

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The carrying values of the components of the 2014 Notes and the 2018 Notes are as follows (in thousands):

	September 30, 2018	December 31, 2017
2.75% 2014 Notes due 2034		
Principal amount	$51,250	$201,250
Unamortized debt discount	(1,248)	(5,087)
Unamortized debt issuance cost	(250)	(925)
	49,752	195,238
2.75% 2018 Notes due 2034		
Principal amount	150,000	—
Premium accretion of 2018 Notes	2,541	—
Unamortized debt discount	(30,927)	—
Unamortized debt issuance cost	(2,021)	—
	119,593	—
	$169,345	$195,238

2018 Revolving Credit Facility

On August 2, 2018, the Company entered into a revolving credit facility with Silicon Valley Bank (Revolving Credit Facility) in an aggregate principal amount of up to the lesser of (i) $15.0 million (Maximum Amount) or (ii) the sum of (a) 85% of our eligible receivables and (b) 50% of our eligible inventory, in each case, subject to certain limitations (Borrowing Base), provided that the amount of eligible inventory that may be counted towards the Borrowing Base shall be subject to a cap as set forth in the Revolving Credit Facility. Subject to the level of this borrowing base, the Company may make and repay borrowings from time to time until the maturity of the revolving credit facility. As of September 30, 2018, availability under the revolving credit facilit . There were no borrowings outstanding under the Revolving Credit Facility at September 30, 2018.

The Revolving Credit Facility matures on August 2, 2020 and is collateralized by substantially all the Company's property, other than intellectual property. Outstanding loans under the Revolving Credit Facility will bear interest, at the greater of (i) prime rate plus 0.50% or (ii) 5.50%. Interest on any outstanding loans is due and payable monthly and the principal balance is due at maturity though loans can be prepaid at any time without penalty. In addition, the Company pays a quarterly unused revolving line facility fee of .75% per annum on the average unused facility.

Subject to certain exceptions, the Company must pay a prepayment fee equal to (i) 2.00% of the Maximum Amount if it prepays all advances and terminates the Loan Agreement prior to August 2, 2019, or (ii) 1.00% of the Maximum Amount if it prepays all advances and terminates the Loan Agreement on or after August 2, 2019, and prior to the maturity date.

The Company incurred approximately $318,000 of debt issuance costs in connection wtih the facility, including $225,000 in commitment fees. Half of the commitment fee was paid at the inception of the facility with the remainder due on the earliest of (i) August 2, 2019, (ii) the date on which the Company terminates this Agreement or (iii) the

occurrence and continuance of an event of default. Debt issuance costs were capitalized and are being amortized to interest expense over the life of the Revolving Credit Facility.

The Revolving Credit Facility contains customary affirmative and negative covenants which, unless waived by the bank, limit the Company's ability to, among other things, incur additional indebtedness, grant liens, make investments, repurchase stock, pay dividends, transfer assets, enter into affiliate transactions, undergo a change of control, or engage in merger and acquisition activity, including merging or consolidating with a third party. The Revolving Credit Facility also contains customary events of default, subject to customary cure periods for certain defaults, that include, among other things, non-payment defaults, covenant defaults, material judgment defaults, bankruptcy and insolvency defaults, cross-defaults to certain other material indebtedness, and defaults due to inaccuracy of representation and warranties. Upon an event of default, the lender may declare all or a portion of the outstanding obligations payable by the Company to be immediately due and payable and exercise other rights and remedies provided for under the Revolving Credit Facility. During the existence of an event of default, interest on the obligations under the Revolving Credit Facility could be increased to 5.0% above the otherwise applicable rate of interest.

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The Company was in compliance with all the terms and conditions of the Revolving Credit Facility at September 30, 2018.

5. Fair Value Measurements

Financial Instruments

The following tables summarize our cash and available-for-sale securities by significant category within the fair value hierarchy (in thousands):

	September 30, 2018					
	Carrying Amount	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value	Cash and Cash Equivalents	Short-Term Marketable Securities
Assets:						
Cash	$13,756	$ —	$ —	$13,756	$ 13,756	$ —
Available-for-sale:						
Level I:						
Money market funds	22,073	—	—	22,073	22,073	—
Level II:						
U.S. government and agency securities	—	—	—	—	—	—
Total	$35,829	$ —	$ —	$35,829	$ 35,829	$ —

	December 31, 2017					
	Carrying Amount	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value	Cash and Cash Equivalents	Short-Term Marketable Securities
Assets:						
Cash	$20,129	$ —	$ —	$20,129	$ 20,129	$ —
Available-for-sale:						
Level I:						
Money market funds	16,142	—	—	16,142	16,142	—
U.S. treasury securities	497			497		497
Subtotal	16,639	—	—	16,639	16,142	497
Level II:						
U.S. government and agency securities	26,369	—	(1)	26,368	21,785	4,583
Total	$63,137	$ —	$ (1)	$63,136	$ 58,056	$ 5,080

There were no transfers between Level I and Level II measurements during the nine months ended September 30, 2018, and 2017, and there were no changes in the valuation techniques used.

Convertible Notes

The estimated fair value of the 2014 Notes is based on a market approach. The estimated fair value was approximately $44.5 million and $166.2 million (par value $51.3 million and $201.3 million) as of September 30, 2018, and December 31, 2017, respectively, and represents a Level II valuation.

The estimated fair value of the 2018 Notes is based on a market approach. The estimated fair value was approximately $158.6 million (par value $150.0 million) as of September 30, 2018 and represents a Level II valuation.
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When determining the estimated fair value of our long-term debt, we used a commonly accepted valuation methodology and market-based risk measurements that are indirectly observable, such as credit risk.

6. Intangible Assets, net

Intangible assets include developed technology related to the DVS acquisition and other intangible assets included in Other non-current assets. Intangible assets, net, were as follows (in thousands):

	September 30, 2018			
	Gross Amount	Accumulated Amortization	Net	Weighted-Average Amortization Period
Developed technology	$112,000	$(51,800)	$60,200	10.0 years
Patents and licenses	11,274	(6,595)	4,679	7.8 years
Total intangible assets, net	$123,274	$(58,395)	$64,879	

	December 31, 2017			
	Gross Amount	Accumulated Amortization	Net	Weighted-Average Amortization Period
Developed technology	$112,000	$(43,400)	$68,600	10.0 years
Patents and licenses	11,274	(5,721)	5,553	7.8 years
Total intangible assets, net	$123,274	$(49,121)	$74,153	

Amortization of intangibles was $3.1 million for both the three months ended September 30, 2018, and 2017, respectively. Amortization of intangibles was $9.3 million for both the nine months ended September 30, 2018, and 2017. Amortization expense includes the amortization of developed technology. In connection with the acquisition of DVS in February 2014, we acquired developed technology with a gross fair value of $112.0 million. These acquired intangible assets are being amortized to cost of product revenue over their useful life of ten years. Related amortization for developed technology for both the three months ended September 30, 2018, and 2017 was $2.8 million. Amortization for developed technology for both the nine months ended September 30, 2018, and 2017 was $8.4 million.

Based on the carrying value of intangible assets, net as of September 30, 2018, the annual amortization expense for intangible assets is expected to be as follows (in thousands):

Fiscal Year	Amortization Expense
2018 (remainder of the year)	$ 3,060
2019	12,243
2020	12,242
2021	12,088
2022	12,004
Thereafter	13,242

$ 64,879

7. Balance Sheet Details

Inventories

Inventories consisted of the following (in thousands):

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	September 30, 2018	December 31, 2017
Raw materials	$7,635	$7,566
Work-in-process	1,113	929
Finished goods	6,676	6,593
Total inventories, net	$15,424	$15,088

Property and Equipment, net

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

	September 30, 2018	December 31, 2017
Computer equipment and software	$4,173	$4,179
Laboratory and manufacturing equipment	20,318	20,069
Leasehold improvements	7,623	7,799
Office furniture and fixtures	1,882	1,892
Property and equipment, gross	33,996	33,939
Less accumulated depreciation and amortization	(24,244)	(21,646)
Construction-in-progress	8	8
Property and equipment, net	$9,760	$12,301

Warranty
We accrue for estimated warranty obligations once revenue is recognized. Management periodically reviews the estimated fair value of its warranty liability and records adjustments based on the terms of warranties provided to customers, as well as historical and anticipated warranty claim experience. Activity for our warranty accrual for the three and nine months ended September 30, 2018, and 2017, which is included in other accrued liabilities, is summarized below (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Beginning balance	$608	$706	$699	$1,023
Accrual for current period warranties	458	287	1,195	474
Warranty costs incurred	(325)	(300)	(1,153)	(804)
Ending balance	$741	$693	$741	$693

8. Commitments and Contingencies

Operating Leases

We have entered into various long-term non-cancelable operating lease agreements for equipment and facilities expiring at various times through March 2026. We lease office space under non-cancelable leases in the United States,

Canada, Singapore, Japan, China, France and the United Kingdom. Certain facility leases also contain rent escalation clauses. Our lease payments are expensed on a straight-line basis over the life of the leases. Rental expense under operating leases, net of amortization of lease incentives and sublease income for the three and nine months ended September 30, 2018 was $1.2 million and $3.6 million, respectively. Rental expense under operating leases, net of amortization of lease incentives and sublease income for the three and nine months ended September 30, 2017 was $1.2 million and $3.8 million, respectively.

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Future minimum lease payments and minimum sublease income under non-cancelable operating leases as of September 30, 2018, were as follows (in thousands):

Fiscal Year	Minimum Lease Payments	Minimum Sublease Income	Net Operating Leases
2018 (remainder of the year)	$1,023	$(146)	$877
2019	4,060	(591)	3,469
2020	2,194	(200)	1,994
2021	1,275	—	1,275
2022	898	—	898
Thereafter	1,882	—	1,882
Total	$11,332	$(937)	$10,395

Indemnification

From time to time, we have entered into indemnification provisions under certain of our agreements in the ordinary course of business, typically with business partners, customers, and suppliers. Pursuant to these agreements, we may indemnify, hold harmless, and agree to reimburse the indemnified parties on a case-by-case basis for losses suffered or incurred by the indemnified parties in connection with any patent or other intellectual property infringement claim by any third party with respect to our products. The term of these indemnification provisions is generally perpetual from the time of the execution of the agreement. The maximum potential amount of future payments we could be required to make under these indemnification provisions is typically not limited to a specific amount. In addition, we have entered into indemnification agreements with our officers, directors, and certain other employees. With certain exceptions, these agreements provide for indemnification for related expenses including, among others, attorneys' fees, judgments, fines and settlement amounts incurred by any of these individuals in any action or proceeding.

We incurred indemnification expenses between October 2015 and the third quarter of 2017 to defend claims by Thermo Fisher Scientific, Inc., (Thermo) against one of our employees. In December 2015, Thermo filed a complaint in the Circuit Court for the County of Kalamazoo, Michigan against one of its former employees who had recently been hired by us alleging, among other claims, misappropriation of proprietary information and breach of contractual and fiduciary obligations to Thermo while such individual was still an employee of Thermo. In November 2016, Thermo amended its complaint to add us as a party to the litigation, making various commercial and employment-related claims and seeking damages and injunctive relief. In July 2017, we entered into a settlement agreement with Thermo. Pursuant to the terms of the settlement agreement, we agreed to pay Thermo a one-time payment of $3.0 million in exchange for a release and dismissal of all claims with prejudice upon payment of the settlement. In August 2017, we paid the settlement amount of $3.0 million and received a related insurance recovery payment of $1.0 million.

Contingencies

From time to time, we may be subject to various legal proceedings and claims arising in the ordinary course of business. These include disputes and lawsuits related to intellectual property, mergers and acquisitions, licensing,

contract law, tax, regulatory, distribution arrangements, employee relations and other matters. Periodically, we review the status of each matter and assess its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and a range of possible losses can be estimated, we accrue a liability for the estimated loss. Legal proceedings are subject to uncertainties, and the outcomes are difficult to predict. Because of such uncertainties, accruals are based only on the best information available at the time. As additional information becomes available, we continue to reassess the potential liability related to pending claims and litigation and we may revise estimates.

9. Stock-Based Compensation

We recognized stock-based compensation expense of $2.3 million and $6.1 million during the three and nine months ended September 30, 2018, respectively. We recognized stock-based compensation expense of $2.3 million and $7.1 million during the three and nine months ended September 30, 2017, respectively. As of September 30, 2018, we had $4.4 million, $10.3 million, and $1.3 million of unrecognized stock-based compensation expense related to stock options, restricted stock units, and

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performance stock units, respectively, which are expected to be recognized over a weighted average period of 2.8 years, 2.9 years, and 2.5 years, respectively.

Equity Incentive Plans (Excluding Stock Option Exchange Program)

During the three and nine months ended September 30, 2018, we granted certain employees options to purchase 22,282 and 683,821 shares of common stock, respectively. The options granted during the three months ended September 30, 2018, had exercise prices of $6.40 per share and a total grant date fair value of $0.1 million. The options granted during the nine months ended September 30, 2018, had exercise prices ranging from $5.09 to $6.40 per share and a total grant date fair value of $2.2 million.

During the three and nine months ended September 30, 2018, we granted certain employees 73,826 and 1,305,563 restricted stock units, respectively. The restricted stock unit awards granted during the three months ended September 30, 2018, had fair market values of $6.40 per unit and a total grant date fair value of $0.5 million. The restricted stock unit awards granted during the nine months ended September 30, 2018, had fair market values ranging from $5.09 to $7.81 per unit and a total grant date fair value of $6.8 million.

During the nine months ended September 30, 2018, we granted certain executive officers 167,000 performance stock units. The performance stock unit awards had a grant date fair value of $10.09 per unit and a total grant date fair value of $1.7 million.

The expenses relating to these options and restricted stock units will be recognized over their respective four-year vesting periods. The expenses relating to these performance stock units will be recognized over their three-year vesting periods.

2018 Performance Stock Units

During the three months ended March 31, 2018, we granted 167,000 performance stock units to certain executive officers and senior level employees. The number of performance stock units ultimately earned is calculated based on the Total Shareholder Return ("TSR") of our common stock as compared to the TSR of a defined group of peer companies during the performance period from January 1, 2018, to December 31, 2020. The percentage of performance stock units that vest will depend on our relative position at the end of the performance period and can range from 0% to 200% of the number of units granted.

Under FASB ASC Topic 718, the provisions of the performance stock unit awards related to TSR are considered a market condition, and the effects of that market condition should be reflected in the grant date fair value of the awards. We used a Monte Carlo simulation pricing model to incorporate the market condition effects at our grant date with a fair value of $10.09 per unit.

Stock Option Exchange Program

On August 23, 2017, we launched a one-time stock option exchange program (Program) pursuant to which eligible employees were able to exchange certain outstanding stock options (Eligible Options), whether vested or unvested,

with an exercise price greater than $4.37 per share and greater than the closing price of a share of our common stock on the NASDAQ Global Select Market on the expiration date of the exchange offer (Offer), for restricted stock units or stock options (New Awards) covering a lesser number of shares than were subject to the Eligible Options exchanged immediately before being canceled in the Offer. Non-employee members of our Board of Directors were not eligible to participate in the Program. The Program expired on September 20, 2017, with a closing price of $5.13 per share.

115 employees elected to surrender Eligible Options to purchase a total of 1,204,198 shares of our common stock, representing approximately 50.02% of the total shares of common stock underlying the Eligible Options. All surrendered options were canceled effective as of the expiration date, and immediately thereafter, in exchange for such surrendered options, we issued (i) new options to purchase an aggregate of 399,117 shares of our common stock with an exercise price of $5.13; and (ii) restricted stock units representing 54,944 shares of our common stock, each, pursuant to the terms of the Offer and our 2011 Equity Incentive Plan. The new awards granted under the Program generally vest over three years.

The Program did not result in a material incremental stock-based compensation expense because the fair value of the new awards was approximately equal to the fair value of the surrendered options immediately prior to the exchange date. The original fair value of the surrendered options plus the incremental stock-based compensation expense will be recognized over the vesting periods of the New Awards.

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2017 Employee Stock Purchase Plan

In August 2017, our stockholders approved our 2017 Employee Stock Purchase Plan (ESPP). Our ESPP offers U.S. and some non-U.S. employees the right to purchase shares of our common stock. Our ESPP has a six-month offering period, with a new period commencing on the first trading day on or after May 31 and November 30 of each year. Employees are eligible to participate through payroll deductions of up to 10% of their compensation and may not purchase more than $25,000 of stock for any calendar year. The purchase price at which shares are sold under the ESPP is 85% of the lower of the fair market value of a share of our common stock on the first day of the offering period or the last day of the offering period. Our first ESPP offering period began on October 1, 2017, with a shorter offering period ending on November 30, 2017.

2016 Performance-based Stock Options and Restricted Stock Units

In 2016, we granted 184,050 and 87,620 performance-based stock options and performance-based restricted stock units (each, a performance award), respectively, to executive officers and employees, which were accounted for as equity awards. The number of performance awards that ultimately vest depends on the achievement of certain performance criteria set by the Compensation Committee of the Company’s Board of Directors. The performance-based stock options have an exercise price per share of $7.10. We recognize stock-based compensation expense over the vesting period of the performance awards when achievement of the performance criteria becomes probable. The performance criteria were not met and the awards did not vest.

10. Income Taxes

The benefit for income taxes for the periods presented differs from the 21% and the 35% U.S. Federal statutory rate, for the three and nine months ended September 30, 2018, and 2017, respectively, primarily due to maintaining a valuation allowance for deferred tax assets, which primarily consist of net operating loss carryforwards.

We recorded a tax benefit of $0.8 million and $2.2 million for the three and nine months ended September 30, 2018, respectively, which was primarily attributable to the amortization of our acquisition-related deferred tax liability and net operating loss from Canadian operations, partially offset by a tax provision and discrete tax items from our other foreign operations. We recorded a tax benefit of $0.7 million and $3.3 million for the three and nine months ended September 30, 2017, respectively, which was primarily attributable to the amortization of our acquisition-related deferred tax liability and losses from Canadian operations, partially offset by a tax provision and discrete tax items from our other foreign operations.

Recording deferred tax assets is appropriate when realization of these assets is more likely than not. Assessing the realizability of deferred tax assets is dependent upon several factors including historical financial results. The deferred tax assets have been offset by valuation allowances.

In December 2017, the Tax Cuts and Jobs Act (the Tax Act) was enacted. The Tax Act introduced a broad range of tax reform measures that significantly change the federal income tax laws. The provisions of the Tax Act that may have significant impact on us include the permanent reduction of the corporate income tax rate from 35% to 21% (effective for tax years including or commencing on January 1, 2018), one-time transition tax on post-1986 foreign unremitted

earnings, provision for Global Intangible Low-Taxed Income (GILTI), deduction for Foreign-Derived Intangible Income (FDII), repeal of corporate alternative minimum tax, limitation of various business deductions, modification of the maximum deduction of net operating loss with no carryback but indefinite carryforward provision and the limitation on the deductibility of executive compensation.

At September 30, 2018, we continued to analyze the applicable provisions (as described above) of the Tax Act to determine if there would be any material impact to the Company. Based upon the 2018 forecast domestic loss, the exclusion of U.S. ordinary loss from the overall computation of the estimated annual effective tax rate, and the full valuation allowance against U.S. federal and state deferred tax assets, there is no significant impact from the Tax Act provisions as of September 30, 2018. We continue to analyze additional information and new guidance issued by relevant authorities related to the Tax Act which could impact the determination of the net deferred taxes subject to the re-measurement and the related impact to the assessment of valuation allowance. The prospects of supplemental legislation or regulatory processes to address questions that arise because of the Tax Act, or evolving technical interpretations of the tax law, as well as changes to the forecast or other additional analysis may cause the final impact from the Tax Act to differ materially from the provisional amounts recorded. We will continue to appropriately refine such amounts within the measurement period allowed by Staff Accounting Bulletin (SAB) No.118, no later than the fourth quarter of 2018.

11. Information about Geographic Areas

We operate in one reporting segment that develops, manufactures, and commercializes tools for life sciences research. Our chief executive officer manages our operations and evaluates our financial performance on a consolidated basis. For purposes of allocating resources and evaluating regional financial performance, our chief executive officer reviews separate sales information for the different regions of the world. Our general and administrative expenses and our research and development expenses are not allocated to any specific region. Most of our principal operations, other than manufacturing, and our decision-making functions are located at our corporate headquarters in the United States.

The following table presents the total revenue by geographic area of our customers for each period presented (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
United States	$13,233	$11,154	$35,391	$34,659
Europe	8,783	7,711	26,365	23,095
Asia-Pacific	6,526	4,857	17,266	13,710
Other	421	1,025	1,617	2,729
Total revenue	$28,963	$24,747	$80,639	$74,193

No individual customer represented more than 10% of our total revenues for the three and nine months ended September 30, 2018, and 2017.

Sales to customers in China represented 12% or $3.4 million and 11% or $2.8 million of our total revenue for the three months ended September 30, 2018, and 2017, respectively, and 11% for both the nine months ended September 30, 2018 and 2017. Except for China, no other foreign country or jurisdiction had sales in excess of 10% of our total revenue during the three and nine months ended September 30, 2018, and 2017.

12. Shareholders' Equity

At-The-Market Offering

In August 2017, we entered into a Sales Agreement with Cowen and Company, LLC (Cowen) to sell shares of our common stock having aggregate sales proceeds of up to $30 million, from time to time, through an “at-the-market” equity offering program under which Cowen would act as sales agent. Under the Sales Agreement, we set the parameters for the sale of shares, including the number of shares to be issued, the time period during which sales are requested to be made, limitation on the number of shares that may be sold in any one trading day and any minimum price below which sales may not be made.

Under the Sales Agreement, in August 2017, we sold 9,090,909 shares of our common stock, $0.001 par value per share, through Cowen acting as our agent, for aggregate gross proceeds of $30.0 million. Our aggregate net proceeds from such sales were approximately $28.8 million, after deducting related expenses, including commissions to Cowen of approximately $0.7 million and issuance costs of approximately $0.5 million. These sales exhausted the shares that were available for sale under the Sales Agreement.

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

The following discussion and analysis should be read together with our condensed consolidated financial statements and the notes to those statements included elsewhere in this Form 10-Q. This Form 10-Q contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or Exchange Act, that are based on our management's beliefs and assumptions and on information currently available to our management. The forward-looking statements are contained principally in the section entitled "Risk Factors" and this Management's Discussion and Analysis of Financial Condition and Results of Operations. Forward-looking statements include information concerning our possible or assumed future cash flow, revenue, sources of revenue and results of operations, cost of product revenue and product margin, operating and other expenses, unit sales and the selling prices of our products, business strategies, financing plans, expansion of our business, competitive position, industry environment, potential growth opportunities, market growth expectations, and the effects of competition. Forward-looking statements include statements that are not historical facts and can be identified by terms such as "anticipates," "believes," "could," "seeks," "estimates," "expects," "intends," "may," "plans," "potential," "predicts," "projects," "should," "will," "would," or similar expressions and the negatives of those terms.

Forward-looking statements involve known and unknown risks, uncertainties, and other factors that may cause our actual results, performance, or achievements to be materially different from any future results, performance, or achievements expressed or implied by the forward-looking statements. We discuss these risks in greater detail in Part II, Item 1A, "Risk Factors," elsewhere in this Form 10-Q, and in our Annual Report on Form 10-K filed with the Securities and Exchange Commission, or SEC. Given these uncertainties, you should not place undue reliance on these forward-looking statements. Also, forward-looking statements represent our management's beliefs and assumptions only as of the date of this Form 10-Q.

Except as required by law, we assume no obligation to update these forward-looking statements, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future. You should read this Form 10-Q completely and with the understanding that our actual future results may be materially different from what we expect.

"Fluidigm," the Fluidigm logo, "Access Array," "Advanta," "Biomark," "C1," "Callisto," "CyTOF," "Delta Gene," "EP1," "Flex Six," "Helios," "Hyperion," "Imaging Mass Cytometry," "Juno," "Polaris," and "SNP Type" are trademarks or registered trademarks of Fluidigm Corporation. Other service marks, trademarks and trade names referred to in this Form 10-Q are the property of their respective owners.

In this Form 10-Q, "we," "us," and "our" refer to Fluidigm Corporation and its subsidiaries.

Overview

We create, manufacture, and market innovative technologies and tools for life sciences research. We sell instruments and consumables, including integrated fluidic circuits, or IFCs, assays and reagents, to academic institutions, clinical research laboratories, and biopharmaceutical, biotechnology, and agricultural biotechnology, or Ag-Bio, companies and contract research organizations, or CROs. Our technologies and tools are directed at the analysis of deoxyribonucleic acid, or DNA, ribonucleic acid, or RNA, and proteins in a variety of different sample types, from individual cells to bulk tissue.

We were a pioneer in the application of microfluidics to enable high-throughput and highly-multiplexed polymerase chain reactions, or PCR, for genetic analysis, as well as a field known as single-cell genomics, in which the genetic

composition of individual cells is assayed. In February 2014, we purchased DVS Sciences, Inc., whose mass cytometry system enables the highly-multiplexed analysis of cellular surface and intracellular proteins in both blood and tissue.

Researchers have successfully employed our products to help achieve breakthroughs in a variety of fields, including single-cell gene and protein expression, gene regulation, genetic variation, cellular function and applied genetics. These breakthroughs include using our systems to help detect life-threatening mutations in cancer cells, discover cancer associated biomarkers, analyze the genetic composition of individual stem cells and assess the quality of agricultural products, such as seeds or livestock.

We distribute our systems through our direct sales force and support organizations located in North America, Europe, and Asia-Pacific, and through distributors or sales agents in several European, Latin American, Middle Eastern, and Asia-Pacific countries. Our manufacturing operations are located in Singapore, Canada, and South San Francisco, California. Our facility in Singapore manufactures our genomics instruments, several of which are assembled at facilities of our contract manufacturers in Singapore, with testing and calibration of the assembled products performed at our Singapore facility. All our IFCs for commercial sale and some IFCs for our research and development purposes also are fabricated at our Singapore facility. Our mass cytometry instruments for commercial sale, as well as for internal research and development purposes, are manufactured at our facility in Canada. We also manufacture assays and reagents at our facilities in the United States.

Our total revenue for the nine months ended September 30, 2018, was $80.6 million, compared to $74.2 million for the nine months ended September 30, 2017. Our total revenue for the twelve months ended December 31, was $101.9 million in 2017, $104.4 million in 2016, and $114.7 million in 2015. We have incurred significant net losses since our inception in 1999 and, as of September 30, 2018, our accumulated deficit was $544.1 million.

Critical Accounting Policies, Significant Judgments and Estimates

Our condensed consolidated financial statements and the related notes included elsewhere in this Form 10-Q 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. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances. Changes in accounting estimates may occur from period to period. Accordingly, actual results could differ significantly from the estimates made by our management. We evaluate our estimates and assumptions on an ongoing basis. To the extent there are material differences between these estimates and actual results, our future financial statement presentation, financial condition, results of operations, and cash flows will be affected.

Except as otherwise disclosed, there have been no material changes in our critical accounting policies and estimates in the preparation of our condensed consolidated financial statements during the three and nine months ended September 30, 2018, compared to those disclosed in our Annual Report on Form 10-K for the year ended December 31, 2017, as filed with the SEC on March 8, 2018.

Recent Accounting Pronouncements

See Note 2 — “Summary of Significant Accounting Policies” in the notes to our condensed consolidated financial statements.

Results of Operations

The following table presents our historical condensed consolidated statements of operations data for the three and nine months ended September 30, 2018, and 2017, and as a percentage of total revenue for the respective periods (in thousands):

	Three Months Ended September 30,				Nine Months Ended September 30,			
	2018		2017		2018		2017	
Revenue:								
Total revenue	$28,963	100 %	$24,747	100 %	$80,639	100 %	$74,193	100 %
Costs and expenses:								
Cost of product revenue	11,635	40	11,414	46	33,017	41	33,060	45
Cost of service revenue	1,506	5	1,150	5	4,784	6	3,437	5
Research and development	7,430	26	7,683	31	22,072	27	23,668	32
Selling, general and administrative	20,020	69	20,102	81	57,812	72	63,653	86
Total costs and expenses	40,591	140	40,349	163	117,685	146	123,818	167
Loss from operations	(11,628)	(40)	(15,602)	(63)	(37,046)	(46)	(49,625)	(67)
Interest expense	(4,019)	(14)	(1,456)	(6)	(9,824)	(12)	(4,367)	(6)
Other income, net	117	—	379	2	465	1	571	1
Loss before income taxes	(15,530)	(54)	(16,679)	(67)	(46,405)	(58)	(53,421)	(72)
Benefit from income taxes	780	3	735	3	2,167	3	3,343	5
Net loss	$(14,750)	(51)%	$(15,944)	(64)%	$(44,238)	(55)%	$(50,078)	(67)%

Revenue

We generate revenue primarily from sales of our products and services. Our product revenue consists of sales of our high-throughput genomics, single-cell genomics and mass cytometry instruments and consumables, including IFCs, assays, and other reagents. Our service revenue consists of post-warranty service contracts, preventive maintenance plans, instrument parts, installation, and training. We also may receive revenue from our license agreements with third parties. The following table presents our revenue by source for the three and nine months ended September 30, 2018, and 2017 (in thousands):

	Three Months Ended September 30,		Year-Over-Year Change	Nine Months Ended September 30,		Year-Over-Year Change
	2018	2017		2018	2017	
Revenue:						
Instruments	$13,890	$10,518	32%	$31,831	$31,183	2%
Consumables	10,352	10,058	3	34,665	30,200	15
Product revenue	24,242	20,576	18	66,496	61,383	8
Service revenue	4,721	4,133	14	14,143	12,620	12
License revenue	—	38	(100)	—	190	(100)
Total revenue	$28,963	$24,747	17%	$80,639	$74,193	9%

The following table presents our total revenue by geographic area of our customers and as a percentage of total revenue for the three and nine months ended September 30, 2018, and 2017 (in thousands):

	Three Months Ended September 30,				Year-Over-Year Change	Nine Months Ended September 30,				Year-Over-Year Change
	2018		2017			2018		2017		
United States	$13,233	46 %	$11,154	45 %	19 %	$35,391	44 %	$34,659	47 %	2 %
Europe	8,783	30	7,711	31	14	26,365	33	23,095	31	14
Asia-Pacific	6,526	23	4,857	20	34	17,266	21	13,710	18	26
Other	421	1	1,025	4	(59)	1,617	2	2,729	4	(41)
Total	$28,963	100%	$24,747	100%	17 %	$80,639	100%	$74,193	100%	9 %

We sell our instruments to leading academic research institutions, clinical research laboratories, and biopharmaceutical, biotechnology and Ag-Bio companies. Total revenue from our five largest customers comprised 20% and 17% of our total revenue for the three months ended September 30, 2018, and 2017, respectively. Total revenue from our five largest customers comprised 17% and 14% of our total revenue for the nine months ended September 30, 2018, and 2017, respectively.

Total Revenue

Total revenue increased by $4.2 million, or 17%, to $29.0 million for the three months ended September 30, 2018, compared to $24.7 million for the three months ended September 30, 2017. The increase was attributable to a $3.7 million, or 18%, increase in product revenue and a $0.6 million, or 14%, increase in service revenue. The increase in revenue was driven by increased unit sales of mass cytometry products and related services.

Revenue in the United States increased by $2.1 million, or 19%, for the three months ended September 30, 2018, compared to the three months ended September 30, 2017. Revenues in Europe and Asia-Pacific increased by $1.1 million and $1.7 million, or 14% and 34%, respectively, for the three months ended September 30, 2018, compared to the three months ended September 30, 2017. In the United States, growth in mass cytometry revenues were partially offset by lower genomics revenues. The growth in Europe for the third quarter was primarily attributable to increased unit sales of mass cytometry products. The growth in Asia was driven by increased unit sales of mass cytometry products, partially offset by reduced genomics revenue. Revenue in the Other area decreased by $0.6 million, primarily due to lower mass cytometry revenues. Foreign currency had a minimal impact on revenue for the quarter.

Total revenue increased by $6.4 million, or 9%, to $80.6 million for the nine months ended September 30, 2018, compared to $74.2 million for the nine months ended September 30, 2017. The increase was primarily due to an increase of $5.1 million in product revenue and a $1.5 million increase in service revenue, partially offset by a $0.2 million decrease in license revenue. Europe and the Asia-Pacific regions increased by $3.3 million and $3.6 million, or 14% and 26%, respectively, for the nine months ended September 30, 2018, compared to the nine months ended September 30, 2017. In the United States, growth in mass cytometry revenue was partially offset by lower genomics revenue. The growth in Europe was primarily attributable to increased unit sales of genomics products, partially offset by a reduction in mass cytometry products. The growth in Asia was driven by increased unit sales of mass cytometry products. Revenue in the Other geographic region decreased by $1.1 million, or 41%, for the nine months ended September 30, 2018, compared to the nine months ended September 30, 2017. The decline was attributable to a reduction in mass cytometry products.

Product Revenue

Product revenue increased by $3.7 million, or 18%, to $24.2 million for the three months ended September 30, 2018, compared to $20.6 million for the three months ended September 30, 2017. Consumables revenue increased by $0.3

million, or 3%, to $10.4 million, for the three months ended September 30, 2018, compared to $10.1 million for the three months ended September 30, 2017, driven by higher mass cytometry sales, partially offset by lower genomics. Instrument revenue increased by $3.4 million, or 32%, to $13.9 million for the three months ended September 30, 2018, compared to $10.5 million for the three months ended September 30, 2017. The increase was primarily attributable to higher unit sales of mass cytometry instruments, partially offset by lower unit sales of our genomics instruments.

Product revenue increased by $5.1 million, or 8%, to $66.5 million for the nine months ended September 30, 2018, compared to $61.4 million for the nine months ended September 30, 2017. Consumables revenue increased by $4.5 million, or 15%, to $34.7 million, for the nine months ended September 30, 2018 compared to $30.2 million for the nine months ended September 30, 2017, primarily driven by higher mass cytometry and, to a lesser extent, higher genomics sales. Instrument

revenue increased by $0.6 million, or 2%, to $31.8 million for the nine months ended September 30, 2018 compared to $31.2 million for the nine months ended September 30, 2017, with the impact of higher average selling prices partially offset by lower unit sales.

We expect the average selling prices and volumes of our products to fluctuate over time based on market conditions, product mix, and currency fluctuations. We cannot provide assurance concerning future revenue growth, if any.

Service Revenue

Service revenue increased by $0.6 million, or 14%, to $4.7 million for the three months ended September 30, 2018, compared to $4.1 million for the three months ended September 30, 2017. For the three months ended September 30, 2018, the increase in service revenue was largely due to post warranty sales contracts. Service revenue increased by $1.5 million, or 12%, to $14.1 million for the nine months ended September 30, 2018, compared to $12.6 million for the nine months ended September 30, 2017. The year-over-year growth for the nine-month periods was primarily attributable to an increase in post-warranty service contracts and other fee-for-service offerings, including training, installation, parts and labor, for mass cytometry instruments, partially offset by a decline in genomics services.

License Revenue

We had no license revenue for the three and nine months ended September 30, 2018. License revenue for the three and nine months ended September 30, 2017 was $38,000 and $190,000, respectively.

Costs of Product and Service Revenue

The following table presents our costs of product and service revenue and product and service margins for the three and nine months ended September 30, 2018, and 2017 (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Cost of product revenue	$11,635	$11,414	$33,017	$33,060
Product margin	52 %	45 %	50 %	46 %
Cost of service revenue	$1,506	$1,150	$4,784	$3,437
Service margin	68 %	72 %	66 %	73 %

Cost of product revenue includes manufacturing costs incurred in the production process, including component materials, labor and overhead, packaging, and delivery costs. In addition, cost of product revenue includes amortization of developed technology and intangibles, royalty costs for licensed technologies included in our products, warranty, provisions for slow-moving and obsolete inventory, and stock-based compensation expense. Cost of service revenue includes direct labor hours, overhead, and instrument parts. Costs related to license revenue are included in research and development expense.

Cost of product revenue increased by $0.2 million, or 2%, to $11.6 million for the three months ended September 30, 2018, compared to the three months ended September 30, 2017. Overall cost of product revenue as a percentage of related revenue was 48% and 55% for the three months ended September 30, 2018, and 2017, respectively. Product margin increased by seven percentage points compared to the same period in 2017, primarily due to lower consumables production costs, driven by higher capacity utilization, favorable product mix and the impact of allocating fixed amortization of developed technology over a higher revenue base.

Cost of product revenue was essentially unchanged at $33.0 million for the nine months ended September 30, 2018, compared to the nine months ended September 30, 2017. Overall cost of product revenue as a percentage of related revenue was 50% and 54% for the nine months ended September 30, 2018 and 2017, respectively. Product margin increased by four percentage points compared to the same period in 2017, largely attributable to fixed amortization of developed technology over higher revenues and favorable product mix.

Our cost of product revenue and related product margin may fluctuate depending on the capacity utilization of our manufacturing facilities in response to market conditions and the demand for our products.

Cost of service revenue increased by $0.4 million, or 31%, to $1.5 million for the three months ended September 30, 2018, compared to the three months ended September 30, 2017. Overall cost of service revenue as a percentage of related revenue was 32% and 28% for the three months ended September 30, 2018, and 2017, respectively. Service margins decreased four percentage points during the three months ended September 30, 2018, compared to the same period in 2017, primarily due to product mix, with a greater percentage of service revenue coming from servicing mass cytometry products than genomics products. Service costs tend to be higher for mass cytometry instruments compared to genomics instruments.

Cost of service revenue increased by $1.3 million, or 39%, to $4.8 million for the nine months ended September 30, 2018 compared to the nine months ended September 30, 2017. Overall cost of service revenue as a percentage of related revenue was 34% and 27% for the nine months ended September 30, 2018 and 2017, respectively. The service margin decreased seven percentage points during the nine months ended September 30, 2018 compared to the same period in 2017, due to a greater proportion of higher cost mass cytometry service revenue.

Our cost of service revenue and related service margin may fluctuate depending on the variability in material and labor costs of servicing instruments between mass cytometry and genomics.

Operating Expenses

The following table presents our operating expenses for the three and nine months ended September 30, 2018, and 2017 (in thousands):

	Three Months Ended September 30,		Year-Over-Year Change	Nine Months Ended September 30,		Year-Over-Year Change
	2018	2017		2018	2017	
Research and development	$7,430	$7,683	(3)%	$22,072	$23,668	(7)%
Selling, general and administrative	20,020	20,102	—%	57,812	63,653	(9)%
Total	$27,450	$27,785	(1)%	$79,884	$87,321	(9)%

Research and Development

Research and development expense consists primarily of personnel and independent contractor costs, prototype and material expenses, and other allocated facilities and information technology expenses. We have made substantial investments in research and development since our inception. Our research and development efforts have focused primarily on enhancing our technologies and supporting development and commercialization of new and existing products and services.

Research and development expense decreased by $0.3 million, or 3%, to $7.4 million for the three months ended September 30, 2018, compared to the three months ended September 30, 2017 primarily due to reduced costs for outside services.

Research and development expense decreased by $1.6 million, or 7%, to $22.1 million for the nine months ended September 30, 2018, compared to the nine months ended September 30, 2017. The decrease was primarily attributable to the implementation of our cost-savings initiatives in the first quarter of 2017, including headcount and compensation savings of $1.4 million.

Selling, General and Administrative

Selling, general and administrative expense consists primarily of personnel costs for our sales and marketing, business development, finance, legal, human resources, and general management, as well as professional services, such as legal and accounting services.

Selling, general and administrative expense decreased $0.1 million to $20.0 million for the three months ended September 30, 2018, compared to the three months ended September 30, 2017. This decrease was primarily due to lower legal expenses of $0.5 million, lower consulting costs of $0.4 million, and lower depreciation of $0.3 million. These decreases were partially offset by the impact of higher compensation costs, including the impact of annual merit increases.

Selling, general and administrative expense decreased $5.8 million, or 9%, to $57.8 million for the nine months ended September 30, 2018 compared to the nine months ended September 30, 2017. This decrease was primarily due to the implementation of our cost-savings initiatives in the first quarter of 2017, including headcount and compensation savings of $2.4 million. In addition, we had lower legal expenses of $2.5 million and a decrease in depreciation expense of $1.3 million.

Interest Expense and Other (Income) Expense, Net

The following table presents these items for the three and nine months ended September 30, 2018, and 2017 (in thousands):

	Three Months Ended September 30,		Year-Over-Year Change	Nine Months Ended September 30,		Year-Over-Year Change
	2018	2017		2018	2017	
Interest expense	$4,019	$1,456	176%	$9,824	$4,367	125%
Other (income), net	(117)	(379)	(69)%	(465)	(571)	(19)%
Total	$3,902	$1,077	262%	$9,359	$3,796	147%

In February 2014, we issued $201.3 million aggregate principal amount of our 2.75% 2014 Notes due 2034, which we refer to as our “2014 Notes.” The 2014 Notes accrue interest at a rate of 2.75% per year, payable semi-annually in arrears on February 1 and August 1 of each year. The 2014 Notes will mature on February 1, 2034, unless earlier converted, redeemed, or repurchased in accordance with the terms of the 2014 Notes.

In March 2018, we entered into privately negotiated transactions with certain holders of our 2014 Notes to exchange $150.0 million in aggregate principal amount of the 2014 Notes for $150.0 million in aggregate principal amount of our new 2.75% Exchange Convertible Senior Notes due 2034, which we refer to as our "2018 Notes," and collectively with the 2014 Notes, the "Notes." The 2018 Notes accrue interest at a rate of 2.75%, payable semi-annually in arrears on February 1 and August 1 of each year. Interest on the 2018 Notes will accrue from February 1, 2018. The 2018 Notes will mature on February 1, 2034, unless earlier converted, redeemed, or repurchased in accordance with the terms of the 2018 Notes.

Interest expense was $4.0 million and $1.5 million for the three months ended September 30, 2018, and 2017, respectively. The increase in interest expense during the three months ended September 30, 2018 was due to amortization of debt discount, debt issuance costs, and premium accretion associated with the 2018 Notes.

Interest expense was $9.8 million and $4.4 million for the nine months ended September 30, 2018 and 2017, respectively. The increase in interest expense during the nine months ended September 30, 2018 was due to amortization of debt discount, debt issuance costs, and premium accretion associated with the 2018 Notes.

Other income decreased by $0.3 million for the three months ended September 30, 2018, compared to the three months ended September 30, 2017, mainly due to the net effects of foreign exchange rate changes.

Other income decreased by $0.1 million for the nine months ended September 30, 2018, compared to the nine months ended September 30, 2017, mainly due to the net effects of foreign exchange rate changes.

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Benefit from Income Taxes

We recorded a tax benefit of $0.8 million and $0.7 million for the three months ended September 30, 2018 and 2017, respectively, which was primarily attributable to the amortization of our acquisition-related deferred tax liability, net operating loss from our Canadian operations and discrete tax items, partially offset by a tax provisions related to our other foreign operations. We recorded a tax benefit of $2.2 million and $3.3 million for the nine months ended September 30, 2018 and 2017, respectively. The reduction in the tax benefit for the nine months ended September 30, 2018, as compared to the same period in the prior year, is primarily related to a higher tax provision related to our foreign operations in the nine months ended September 30, 2018.

Liquidity and Capital Resources

Sources of Liquidity

As of September 30, 2018, our principal sources of liquidity consisted of $35.8 million of cash and cash equivalents as well as availability under our Revolving Credit Facility. As of September 30, 2018, our working capital excluding deferred revenue was $44.5 million.

The following table presents our cash flow summary for each period presented (in thousands):

	Nine Months Ended September 30,	
	2018	2017
Net cash used in operating activities	$(24,563)	$(24,759)
Net cash provided by investing activities	4,738	21,537
Net cash provided by (used in) financing activities	(2,292)	28,816
Net (decrease) increase in cash and cash equivalents	(22,227)	25,899

Net Cash Used in Operating Activities

We derive cash flows from operations primarily from cash collected from the sale of our products and services. Our cash flows from operating activities are also significantly influenced by our use of cash for operating expenses to support the growth of our business. We have historically experienced negative cash flows from operating activities as we have expanded our business and built our infrastructure domestically and internationally.

Net cash used in operating activities for the nine months ended September 30, 2018, was $24.6 million and consisted of a net loss of $44.2 million, adjusted for non-cash items of $24.3 million and net change in assets and liabilities of $4.7 million. Non-cash items included amortization of developed technology of $8.4 million, stock-based compensation expense of $6.1 million, amortization of debt discounts, premium and issuance cost of $5.7 million and depreciation and amortization of $4.1 million. The net change in assets and liabilities included a decrease in other liabilities of $4.7 million, an increase in accounts receivable of $3.3 million, an increase in inventory of $0.8 million, and an increase in other assets of $0.1 million, partially offset by an increase in accounts payable of $2.1 million, and an increase in deferred revenue of $2.1 million.

Net cash used in operating activities for the nine months ended September 30, 2017, was $24.8 million, and consisted of a net loss of $50.1 million, adjusted for non-cash items of $20.8 million, and a net change in assets and liabilities of $4.5 million. Non-cash items included stock-based compensation expense of $7.1 million, amortization of developed technology of $8.4 million, depreciation and amortization of $5.6 million, offset by non-cash items of $0.5 million.

The net change in assets and liabilities included a decrease in inventory of $2.1 million, and a decrease in other assets of $1.6 million, an increase in accounts payable of $1.1 million, an increase in deferred revenue of $0.9 million, and a decrease in accounts receivable of $0.8 million, partially offset by a decrease in other liabilities of $1.9 million.

Net Cash Provided by Investing Activities

Our primary investing activities consist of purchases, sales, and maturities of our short-term investments and to a much lesser extent, capital expenditures for manufacturing, laboratory, computer equipment and software to support our infrastructure and work force. We expect to continue to incur costs for capital expenditures, however, as part of our efficiency and cost-savings initiatives, we may decrease or defer certain capital expenditures while further optimizing our organization.

Net cash provided by investing activities was $4.7 million during the nine months ended September 30, 2018. Net cash provided by investing activities primarily consisted of $6.5 million of proceeds from sales and maturities of investments, partially offset by purchases of investments of $1.5 million and capital expenditures of $0.4 million.

Net cash provided by investing activities was $21.5 million during the nine months ended September 30, 2017. Net cash provided by investing activities primarily consisted of $24.4 million of proceeds from sales and maturities of investments, partially offset by purchases of investments of $1.5 million and capital expenditures of $1.4 million.

Net Cash Provided by or Used in Financing Activities

Net cash used in financing activities was $2.3 million during the nine months ended September 30, 2018. Net cash used in financing activities primarily consisted of issuance costs of $2.8 million for the 2018 Notes and Revolving Credit Facility, $0.1 million for income taxes related to net share settlement of equity awards, partially offset by $0.6 million of proceeds from issuance of common stock.

Net cash provided by financing activities was $28.8 million for the nine months ended September 30, 2017 and consisted of net proceeds of $28.8 million from our "at-the market" equity offering in August 2017, and proceeds from exercise of stock options, partially offset by payments for taxes related to net share settlement for vested restricted stock units.

Liquidity and Capital Resources

At September 30, 2018, our working capital excluding deferred revenue was $44.5 million, which includes cash and cash equivalents of $35.8 million.

On August 10, 2017, we sold 9.1 million shares of our common stock through an “at-the-market” equity offering program, for aggregate net proceeds of approximately $28.8 million. We plan to use the net proceeds from this offering for general corporate purposes and working capital.

As of September 30, 2018, we have an effective shelf registration statement on file with the Securities and Exchange Commission (SEC) that allows us to issue certain securities from time to time in one or more offerings up to an aggregate offering price of $95.0 million, after subtracting our $30.0 million “at-the-market” equity offering program completed in 2017.

Each issuance under the shelf registration will require us to file a prospectus supplement identifying the amount and terms of the securities to be issued.

In February 2014, we closed an underwritten public offering of $201.3 million in aggregate principal amount of our 2.75% Senior Convertible Notes due 2034, which we refer to as our “2014 Notes.” In March 2018, we entered into privately negotiated transactions with certain holders of our 2014 Notes to exchange $150.0 million in aggregate principal amount of the 2014 Notes for $150.0 million in aggregate principal amount of our new 2.75% Exchange Convertible Senior Notes due 2034, which we refer to as our "2018 Notes," and collectively with the 2014 Notes, the "Notes". Following the exchange transactions, approximately $51.3 million in aggregate principal amount of 2014 Notes remained outstanding. Our board of directors determined that the private exchange transactions were in the best interest of the company and our stockholders following substantial review with management and our financial advisors concerning the amount of our outstanding indebtedness relative to the market capitalization of our common

stock and, in particular, obligations under the indenture for the 2014 Notes that could require us to repurchase the 2014 Notes beginning in 2021 at a repurchase price equal to the aggregate principal amount of the 2014 Notes (approximately $201.3 million prior to the exchange). The principal differences between the 2014 Notes and the 2018 Notes are the following:

- The date on which we may be first required to repurchase the 2018 Notes has been extended to February 2023, compared to February 2021 under the 2014 Notes. In addition, while the applicable cash repurchase price for the 2014 Notes is 100% of the outstanding principal amount, the cash repurchase price for the 2018 Notes is based on a formula that would result in the 2018 Notes being redeemed for up to an amount equal to 120% of the original principal amount, plus, in each case, accrued and unpaid interest.

- The initial conversion price under the 2018 Notes is approximately $7.88, as compared to approximately $55.94 under the 2014 Notes. As a result, each of the outstanding 2018 Notes is initially convertible into 126.9438 shares of our

common stock per $1,000 principal amount, while the 2014 Notes are initially convertible into 17.8750 shares of our common stock per $1,000 principal amount.

- Under the supplemental indenture for the 2018 Notes, we may at any time cause the then-outstanding 2018 Notes to be converted into shares of our common stock at the then-applicable 2018 Exchange Note conversion price if the volume weighted average price of our common stock is at least 110% of the applicable 2018 Exchange Note conversion price on each applicable trading day over a period specified in the supplement indenture for the 2018 Notes. Under the indenture for the 2014 Notes, we may only redeem the 2014 Notes for cash under certain circumstances during the period from February 6, 2018, through February 6, 2021.

- Under certain circumstances such as a “fundamental change” (as defined in the applicable indenture) that occurs prior to (i) February 6, 2021, in the case of the 2014 Notes and (ii) February 6, 2023, in the case of the 2018 Notes, holders of the Notes are entitled to a “make-whole” premium that will result in an increase in the applicable conversion rate. Under the terms of the 2018 Notes (but not the 2014 Notes), holders will be entitled to receive additional shares reflecting the economic equivalent of approximately two years of additional coupon payments, subject to certain limitations, in connection with a voluntary conversion by the noteholder prior to our exercise of our early conversion option.

The foregoing summaries of the 2014 Notes, the 2018 Notes, and the exchange transactions completed in March 2018 are not complete and are qualified in their entirety by the applicable indentures, forms of global notes, and other agreements and documents filed with the Securities and Exchange Commission with respect to the 2018 Notes and the exchange, and investors should refer to the text of the Second Supplemental Indenture, dated March 6, 2018, between the Company and U.S. Bank National Association and the Form of Global Note included in the Second Supplemental Indenture, which are incorporated by reference as Exhibits 4.6 and 4.7, respectively, in our Annual Report on Form 10-K for the year ended December 31, 2017. With respect to the 2014 Notes, of which approximately $51.3 million in aggregate principal amount remains outstanding, investors should refer to the text of the Indenture, dated as of February 4, 2014, by and between Fluidigm Corporation and U.S. Bank National Association, the First Supplemental Indenture, dated as of February 4, 2014, by and between Fluidigm Corporation and U.S. Bank National Association, and the Form of Global Note included in the First Supplemental Indenture which are incorporated by reference as Exhibits 4.2, 4.3 and 4.4, respectively, in our Annual Report on Form 10-K for the year ended December 31, 2017.

Interest expense related to the 2014 Notes and 2018 Notes, collectively, the ("Convertible Notes") was approximately $4.0 million and $1.5 million during the three months ended September 30, 2018, and 2017, respectively. Interest expense related to the Convertible Notes was approximately $9.8 million and $4.4 million during the nine months ended September 30, 2018, and 2017, respectively. The effective interest rate on the 2014 Notes and the 2018 Notes is approximately 3.0% and 12.3%, respectively.

On August 2, 2018, we entered into a Revolving Credit Facility with Silicon Valley Bank, which matures on August 2, 2020. Amounts drawn under the Revolving Credit Facility will be used for working capital and general corporate purposes. As of September 30, 2017, total availability under the Revolving Credit Facility was $12.8 million. We currently have no outstanding debt under the Revolving Credit Facility, and we are in compliance with all the terms and conditions of the loan agreement governing the Revolving Credit Facility. See Note 4 to the Condensed Consolidated Financial Statements included in this Form 10-Q for more information about the Revolving Credit Facility.

In early 2017, we implemented a retention incentive plan that provided for payment of cash bonuses in January 2019 to plan participants who were employees at the time the plan was implemented and who remained with Fluidigm through January 1, 2019. In September 2018, certain plan participants were permitted to elect to surrender their right to receive all or a portion of the cash bonus in exchange for fully vested restricted stock units (RSUs) issued under our

2011 Equity Incentive Plan (the exchange program). Among other reasons, our Compensation Committee adopted the exchange program to encourage employee stock ownership and to effectively manage cash resources. Participants opted to exchange approximately $2.4 million of cash bonus payments for approximately 380,000 fully vested RSUs issued in November 2018. The anticipated cash bonus payments payable in January 2019 for plan participants that remain employed with Fluidigm through January 1, 2019 is approximately $3.4 million.

We believe our existing cash, cash equivalents, and investments will be sufficient to meet our working capital and capital expenditure needs for at least the next 18 months. However, we may experience lower than expected cash generated from sales of our products and services or greater than expected capital expenditures, cost of revenue, or operating expenses, and we may need to raise additional capital to fund our operations, further our research and development activities, or acquire or invest in a

business. Our future funding requirements will depend on many factors, including market acceptance of our products, the cost of our research and development activities, the cost of filing and prosecuting patent applications, the cost associated with litigation or disputes relating to intellectual property rights or otherwise, the cost and timing of regulatory clearances or approvals, if any, the cost and timing of establishing additional sales, marketing, and distribution capabilities, the cost and timing of establishing additional technical support capabilities, and the effect of competing technological and market developments. In the future, we may acquire businesses or technologies from third parties, and we may decide to raise additional capital through debt or equity financing to the extent we believe this is necessary to successfully complete these acquisitions.

If we require additional funds in the future, we may not be able to obtain such funds on acceptable terms, or at all. If we raise additional funds by issuing equity securities, our stockholders could experience dilution. Debt financing, if available, may involve covenants restricting our operations or our ability to incur additional debt. Any additional debt or equity financing that we raise may contain terms that are not favorable to us or our stockholders. If we do not have, or are not able to obtain, sufficient funds, we may have to delay development or commercialization of our products or license to third parties the rights to commercialize products or technologies that we would otherwise seek to commercialize. We also may have to reduce marketing, customer support, research and development, or other resources devoted to our products.

Off-Balance Sheet Arrangements

As of September 30, 2018, we did not have any off-balance sheet arrangements as defined in Item 303(a)(4) of the Securities and Exchange Commission's Regulation S-K.

Contractual Obligations and Commitments

Our operating lease obligations include a lease for our current headquarters and leases for manufacturing, laboratory, warehousing and office space for our foreign subsidiaries. Please see Note 8 to the financial statements for our lease obligations.

Other than as disclosed above, there have been no material changes during the nine months ended September 30, 2018 to our contractual obligations disclosed in our “Management’s Discussion and Analysis of Financial Condition and Results of Operations” included in our Annual Report on Form 10-K for the year ended December 31, 2017.

Item 3. Quantitative and Qualitative Disclosures about Market Risk

Market risk represents the risk of loss that may impact our financial position due to adverse changes in financial market prices and rates. Our market risk exposure is primarily a result of fluctuations in foreign currency exchange rates and interest rates. We do not hold or issue financial instruments for trading purposes.

Foreign Currency Exchange Risk

As we expand internationally, our results of operations and cash flows will become increasingly subject to fluctuations due to changes in foreign currency exchange rates. Our revenue is generally denominated in the local currency of the contracting party. Historically, the majority of our revenue has been denominated in U.S. dollars. Our expenses are generally denominated in the currencies in which our operations are located, which is primarily in the United States, with a portion of expenses incurred in Singapore and Canada where our manufacturing facilities are located. Our results of operations and cash flows are, therefore, subject to fluctuations due to changes in foreign currency exchange rates. The volatility of exchange rates depends on many factors that we cannot forecast with reliable accuracy. We have experienced and will continue to experience fluctuations in our net income or loss as a result of transaction gains

or losses related to revaluing certain current asset and current liability balances that are denominated in currencies other than the functional currency of the entities in which they are recorded. For the nine months ended September 30, 2018 and 2017, our gain related to changes in foreign exchange rates was $0.1 million and $0.3 million, respectively. To date, we have not entered into any foreign currency hedging contracts although we may do so in the future. As our international operations grow, we will continue to reassess our approach to manage our risk relating to fluctuations in currency rates. If foreign currency exchange rates had changed by 10% during the periods presented, it would not have had a material impact on our financial position or results of operations.

Interest Rate Sensitivity

We had cash and cash equivalents of $35.8 million at September 30, 2018. These amounts were held primarily in cash on deposit with banks, treasury bills and money market funds which are short-term. Cash and cash equivalents and investments are held for working capital purposes. Due to the short-term nature of these investments, we believe that we do not have any material exposure to changes in the fair value of our investment portfolio due to changes in interest rates. Declines in interest rates, however, will reduce future investment income. If overall interest rates had decreased by 10% during the periods presented, our interest income would not have been materially affected.

Fair Value of Financial Instruments

We do not have material exposure to market risk with respect to investments. We do not use derivative financial instruments for speculative or trading purposes. However, we may adopt specific hedging strategies in the future.

Item 4. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and our Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of September 30, 2018. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of September 30, 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.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the three months ended September 30, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Limitations on the Effectiveness of Controls

Control systems, no matter how well conceived and operated, are designed to provide a reasonable, but not an absolute, level of 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 costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. Because of the inherent limitations in any control system, misstatements due to error or fraud may occur and not be detected.

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PART II. OTHER INFORMATION

Item 1. Legal Proceedings

In the normal course of business, we are from time to time involved in legal proceedings or potential legal proceedings, including matters involving employment, intellectual property, or others. Although the results of litigation and claims cannot be predicted with certainty, we currently believe that the final outcome of any currently pending matters would not have a material adverse effect on our business, operating results, financial condition, or cash flows. Regardless of the outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources, and other factors.

Item 1A. Risk Factors

We operate in a rapidly changing environment that involves numerous uncertainties and risks. The following risks and uncertainties may have a material and adverse effect on our business, financial condition, or results of operations. You should consider these risks and uncertainties carefully, together with all of the other information included or incorporated by reference in this Form 10-Q. If any of the risks or uncertainties we face were to occur, the trading price of our securities could decline, and you may lose all or part of your investment.

Risks Related to Fluidigm's Business and Strategy

Our financial results and revenue growth rates have varied significantly from quarter-to-quarter and year-to-year due to a number of factors, and a significant variance in our operating results or rates of growth, if any, could lead to substantial volatility in our stock price.

Our total revenue was $101.9 million in 2017, $104.4 million in 2016, and $114.7 million in 2015. The decrease in overall revenue over this period was due in significant part to decreasing sales of single-cell genomics instruments, driven by a combination of factors including changes in customer demand, increased competition, and performance issues in certain IFCs used in our C1 systems.

Our revenue, results of operations, and revenue growth rates have varied in the past and may continue to vary significantly from quarter-to-quarter or year-to-year. For example, in 2011, 2012, 2014 and 2015, we experienced higher sales in the fourth quarter than in the first quarter of the next fiscal year. Although this was not the case in the fourth quarter of 2013 compared to the first quarter of 2014, this seasonal historical trend continued in 2014 and 2015 with a decrease in revenue in the first quarters of 2015 and 2016, respectively. However, sales increased slightly in the first quarter of 2017 compared to the fourth quarter of 2016. Additionally, for the quarters ended March 31, 2015 and September 30, 2015, we experienced year-over-year revenue growth rates that were substantially lower than revenue growth rates experienced in other periods since our initial public offering, and we experienced a year-over-year decline in revenue for the quarters ended September 30, 2017, June 30, 2017, March 31, 2017, September 30, 2016, June 30, 2016 and September 30, 2015, and for the years ended December 31, 2017, 2016 and 2015. We may experience substantial variability in our product mix from period-to-period as revenue from sales of our instruments relative to sales of our consumables may fluctuate or deviate significantly from expectations. Variability in our quarterly or annual results of operations, mix of product revenue, or rates of revenue growth, if any, may lead to volatility in our stock price as research analysts and investors respond to these fluctuations. These fluctuations are due to numerous factors that are difficult to forecast, including: fluctuations in demand for our products; changes in customer budget cycles and capital spending; seasonal variations in customer operations; tendencies among some customers to defer purchase decisions to the end of the quarter; the large unit value of our systems, particularly our proteomics systems; changes in our pricing and sales policies or the pricing and sales policies of our competitors; our ability to design, manufacture, market, sell, and deliver products to our customers in a timely and cost-effective

manner; fluctuations or reductions in revenue from sales of legacy instruments that may have contributed significant revenue in prior periods; quality control or yield problems in our manufacturing operations; our ability to timely obtain adequate quantities of the materials or components used in our products, which in certain cases are purchased through sole and single source suppliers; new product introductions and enhancements by us and our competitors; unanticipated increases in costs or expenses; our complex, variable and, at times, lengthy sales cycle; global economic conditions; and fluctuations in foreign currency exchange rates. Additionally, we have certain customers who have historically placed large orders in multiple quarters during a calendar year. A significant reduction in orders from one or more of these customers could adversely affect our revenue and operating results, and if these customers defer or cancel purchases or otherwise alter their purchasing patterns, our financial results and actual results of operations could be significantly impacted. Other unknown or unpredictable factors also could harm our results.

The foregoing factors, as well as other factors, could materially and adversely affect our quarterly and annual results of operations and rates of revenue growth, if any. We have experienced significant revenue growth in the past but we may not achieve similar growth rates in future periods. You should not rely on our operating results for any prior quarterly or annual period as an indication of our future operating performance. If we are unable to return to adequate revenue growth, our operating results could suffer and our stock price could decline. In addition, a significant amount of our operating expenses are relatively fixed due to our manufacturing, research and development, and sales and general administrative efforts. Any failure to adjust spending quickly enough to compensate for a shortfall relative to our anticipated revenue could magnify the adverse impact of such shortfalls on our results of operations. We expect that our sales will continue to fluctuate on an annual and quarterly basis and that our financial results for some periods may be below those projected by securities analysts, which could significantly decrease the price of our common stock.

We have incurred losses since inception, and we may continue to incur substantial losses for the foreseeable future.

We have incurred significant losses in each fiscal year since our inception, including net losses of $14.8 million and $44.2 million during the three and nine months ended September 30, 2018, and net losses of $60.5 million and $76.0 million for the years ended December 31, 2017 and 2016, respectively. As of September 30, 2018, we had an accumulated deficit of $544.1 million. These losses have resulted principally from costs incurred in our research and development programs, and from our manufacturing costs and selling, general, and administrative expenses. We believe that our continued investment in research and development, sales, and marketing is essential to our long-term competitive position and future revenue growth.

Due to our negative revenue growth in 2016 and 2015, we implemented certain operational efficiency and cost-savings initiatives beginning in the first quarter of 2017 intended to align our resources with our product strategy, reduce our operating expenses, and manage our cash flows. These cost efficiency initiatives have included targeted workforce reductions, optimizing our facilities, and reducing excess space. Further actions such as these may be required on an ongoing basis to optimize our organization. For example, we may need to decrease or defer capital expenditures and development activities or implement further operating expense reduction measures. Such measures may impair our ability to invest in developing, marketing and selling new and existing products. Furthermore, if such efficiency and cost reduction efforts are unsuccessful, our cash position could be negatively impacted and we may, among other things, be required to seek additional sources of financing. Until we are able to generate additional revenue to support our level of operating expenses, we will continue to incur operating and net losses and negative cash flow from operations. Because of the numerous risks and uncertainties associated with our commercialization efforts and future product development, we are unable to predict when we will become profitable, and we may never become profitable. Even if we do achieve profitability, we may not be able to sustain or increase our profitability.

If we require additional funds in the future, we may not be able to obtain such funds on acceptable terms, or at all. If we raise funds by issuing equity securities, our stockholders could experience dilution. Debt financing, if available, may involve covenants restricting our operations or our ability to incur additional debt. Any additional debt or equity financing that we raise may contain terms that are not favorable to us or our stockholders. If we do not have, or are not able to obtain sufficient funds, we may have to delay development or commercialization of our products or license to third parties the rights to commercialize products or technologies that we would otherwise seek to commercialize. We may also have to reduce marketing, customer support, research and development or other resources devoted to our products.

We have significant outstanding convertible debt, and may be required to repay, refinance or restructure a portion of such debt before 2021. In February 2014, we issued $201.3 million aggregate principal amount of our 2.75% Senior Convertible Notes due 2034 (2014 Notes), pursuant to an underwriting agreement, dated January 29, 2014. In March

2018, we entered into separate privately negotiated transactions with certain holders of our 2014 Notes to exchange $150.0 million in aggregate principal amount of the 2014 Notes for new convertible notes (the 2018 Notes). Following the exchange, approximately $51.3 million aggregate principal amount of the 2014 Notes remain outstanding in addition to $150.0 million in aggregate principal amount of the 2018 Notes (collectively, the Convertible Notes). The Convertible Notes accrue interest at a rate of 2.75% per year, payable semi-annually in arrears on February 1 and August 1 of each year. The Convertible Notes will mature on February 1, 2034, unless earlier converted, redeemed, or repurchased in accordance with the terms of the respective Notes. Holders of the 2014 Notes may require us to repurchase all or a portion of their 2014 Notes on each of February 6, 2021, February 6, 2024, and February 6, 2029 at a repurchase price in cash equal to 100% of the principal amount of the Notes plus accrued and unpaid interest. Holders of the 2018 Notes may require us to repurchase all or a portion of their 2018 Notes on each of February 6, 2023, February 6, 2026, and February 6, 2029 at a repurchase price in cash equal to 100% of the accreted principal amount (i.e., up to 120% of the outstanding principal amount) of the 2018 Notes plus accrued and unpaid interest. If we undergo a fundamental change, as defined in the terms of each of the applicable series of Notes, (i) holders of the 2014 Notes may require us to repurchase the 2014 Notes in whole or in part for cash at a repurchase price equal to 100% of the principal amount of the 2014 Notes plus accrued and unpaid

interest and (ii) holders of the 2018 Notes may require us to repurchase the 2018 Notes in whole or in part for cash at a repurchase price equal to 100% of the accreted principal amount (i.e., up to 120% of the outstanding principal amount) of the 2018 Notes plus accrued and unpaid interest. If we refinance the debt owed under the 2014 Notes and the 2018 Notes, we may issue additional convertible notes or other debt, which could include additional company obligations and represent more dilution to existing stockholders and noteholders.

The life science markets are highly competitive and subject to rapid technological change, and we may not be able to successfully compete.

The markets for our products are characterized by rapidly changing technology, evolving industry standards, changes in customer needs, emerging competition, new product introductions, and strong price competition. We compete with both established and development stage life science research companies that design, manufacture, and market instruments and consumables for gene expression analysis, single-cell targeted gene expression or protein expression analysis, single nucleotide polymorphism genotyping, or SNP genotyping, polymerase chain reaction, or PCR, digital PCR, other nucleic acid detection, flow cytometry, cell imaging, and additional applications using well established laboratory techniques, as well as newer technologies such as bead encoded arrays, microfluidics, nanotechnology, high-throughput DNA sequencing, microdroplets, and photolithographic arrays. Most of our current competitors have significantly greater name recognition, greater financial and human resources, broader product lines and product packages, larger sales forces, larger existing installed bases, larger intellectual property portfolios, and greater experience and scale in research and development, manufacturing, and marketing than we do. For example, companies such as 10X Genomics, Inc., Affymetrix, Inc. (now part of Thermo Fisher Scientific Inc.), Agena Bioscience, Inc., Agilent Technologies, Inc., Becton, Dickinson and Company, Bio-Rad Laboratories, Inc., Cellular Research, Inc. (now a part of Becton, Dickinson and Company), Danaher Corporation, Illumina, Inc., Life Technologies Corporation (now part of Thermo Fisher Scientific Inc.), LGC Limited, Luminex Corporation, Millipore Corporation, NanoString Technologies, Inc., PerkinElmer, Inc. (through its acquisition of Caliper Life Sciences, Inc.), RainDance Technologies, Inc. (acquisition by Bio-Rad Laboratories, Inc. pending), Roche Diagnostics Corporation, Sony Corporation, Thermo Fisher Scientific Inc., WaferGen Bio-systems, Inc., Cytek Biosciences, Inc., Akoya Biosciences, Inc., Innova Biosciences Ltd., QIAGEN N.V., 1CellBio, Inc., Berkeley Lights, Inc., and Mission Bio, Inc. have products that compete in certain segments of the market in which we sell our products. In addition, we have in recent quarters experienced increased competition in the single-cell genomics market, including new product releases from 10X Genomics, Inc. and WaferGen Bio-systems, Inc. (recently acquired by Takara Bio Inc.), as well as the acquisition of Cellular Research by Becton Dickinson and Company and an announced exclusive partnership between Illumina, Inc. and Bio-Rad Laboratories, Inc. In addition, due to the release of our Hyperion imaging mass cytometry system, we now are exposed to competition from companies offering imaging-based systems, specialized reagents and/or services including Carl Zeiss Inc., Leica Biosystems, Nikon Corporation, Olympus America Inc., Roche Diagnostics Corporation, PerkinElmer, Inc., Agilent Technologies, Inc., IonPath Inc., Zellwerk GmbH, Bruker Corporation, Shimadzu Corporation, NanoString Technologies, Inc., and Neogenomics (Multiomyx).

Competitors may be able to respond more quickly and effectively than we can to new or changing opportunities, technologies, standards, or customer requirements. In light of these advantages, even if our technology is more effective than the product or service offerings of our competitors, current or potential customers might accept competitive products and services in lieu of purchasing our technology. We anticipate that we will continue to face increased competition in the future as existing companies and competitors develop new or improved products and as new companies enter the market with new technologies. Increased competition is likely to result in pricing pressures, which could reduce our profit margins and increase our sales and marketing expenses. In addition, mergers, consolidations, or other strategic transactions between two or more of our competitors, or between our competitor and one of our key customers, could change the competitive landscape and weaken our competitive position, adversely affecting our business.

Market opportunities may not develop as quickly as we expect, limiting our ability to successfully sell our products, or our product development and strategic plans may change and our entry into certain markets may be delayed, if it occurs at all.

The application of our technologies to high-throughput genomics, single-cell genomics and, particularly, mass cytometry applications are in many cases emerging market opportunities. We believe these opportunities will take several years to develop or mature and we cannot be certain that these market opportunities will develop as we expect. The future growth of our markets and the success of our products depend on many factors beyond our control, including recognition and acceptance by the scientific community, and the growth, prevalence, and costs of competing methods of genetic and protein analysis. Additionally, our success depends on the ability of our sales organization to successfully sell our products into these new markets. Our commercial

organization has undergone significant changes in 2016 and 2017, and we are in the early stages of establishing sales of our products for many key applications. If we are not able to successfully market and sell our products, or achieve the revenue or margins we expect, our operating results may be harmed and we may not recover our product development and marketing expenditures. In addition, our product development and strategic plans may change, which could delay or impede our entry into these markets.

If our products fail to achieve and sustain sufficient market acceptance, our revenue will be adversely affected.

Our success depends on our ability to develop and market products that are recognized and accepted as reliable, enabling and cost-effective. Most of our potential customers already use expensive research systems in their laboratories and may be reluctant to replace those systems. Market acceptance of our systems will depend on many factors, including our ability to convince potential customers that our systems are an attractive alternative to existing technologies. Compared to some competing technologies, our technology is relatively new, and most potential customers have limited knowledge of, or experience with, our products. Prior to adopting our systems, some potential customers may need to devote time and effort to testing and validating our systems. Any failure of our systems to meet these customer benchmarks could result in customers choosing to retain their existing systems or to purchase systems other than ours, and revenue from the sale of legacy instruments that may have contributed significant revenue in prior periods may decrease.

In addition, it is important that our systems be perceived as accurate and reliable by the scientific and medical research community as a whole. Historically, a significant part of our sales and marketing efforts has been directed at convincing industry leaders of the advantages of our systems and encouraging such leaders to publish or present the results of their evaluation of our system. If we are unable to continue to induce leading researchers to use our systems, or if such researchers are unable to achieve and publish or present significant experimental results using our systems, acceptance and adoption of our systems will be slowed and our ability to increase our revenue would be adversely affected.

We may experience development or manufacturing problems or delays that could limit the potential growth of our revenue or increase our losses.

We may encounter unforeseen situations in the manufacturing and assembly of our products that would result in delays or shortfalls in our production. For example, our production processes and assembly methods may have to change to accommodate any significant future expansion of our manufacturing capacity, which may increase our manufacturing costs, delay production of our products, reduce our product margin, and adversely impact our business. Conversely, if demand for our products shifts such that a manufacturing facility is operated below its capacity for an extended period, we may adjust our manufacturing operations to reduce fixed costs, which could lead to uncertainty and delays in manufacturing times and quality during any transition period.

Additionally, all of our IFCs for commercial sale are manufactured at our facility in Singapore. Production of the elastomeric block that is at the core of our IFCs is a complex process requiring advanced clean rooms, sophisticated equipment, and strict adherence to procedures. Any contamination of the clean room, equipment malfunction, or failure to strictly follow procedures can significantly reduce our yield in one or more batches. We have in the past experienced variations in yields due to such factors. A drop in yield can increase our cost to manufacture our IFCs or, in more severe cases, require us to halt the manufacture of our IFCs until the problem is resolved. Identifying and resolving the cause of a drop in yield can require substantial time and resources.

Furthermore, developing an IFC for a new application may require developing a specific production process for that type of IFC. While all of our IFCs are produced using the same basic processes, significant variations may be required to ensure adequate yield of any particular type of IFC. Developing such a process can be very time consuming, and

any unexpected difficulty in doing so can delay the introduction of a product.

If our manufacturing activities are adversely impacted, or if we are otherwise unable to keep up with demand for our products by successfully manufacturing, assembling, testing, and shipping our products in a timely manner, our revenue could be impaired, market acceptance for our products could be adversely affected and our customers might instead purchase our competitors' products.

If our research and product development efforts do not result in commercially viable products within anticipated timelines, if at all, our business and results of operations will be adversely affected.

Our business is dependent on the improvement of our existing products, our development of new products to serve existing markets, and our development of new products to create new markets and applications that were previously not practical with existing systems. We intend to devote significant personnel and financial resources to research and development activities designed to advance the capabilities of our technology. We have developed design rules for the implementation of our technology that are frequently revised to reflect new insights we have gained about the technology. In addition, we have discovered that biological or chemical reactions sometimes behave differently when implemented on our systems rather than in a standard laboratory environment. Furthermore, many such reactions take place within the confines of single cells, which have also demonstrated unexpected behavior when grown and manipulated within microfluidic environments. As a result, research and development efforts may be required to transfer certain reactions and cell handling techniques to our systems. In the past, product development projects have been significantly delayed when we encountered unanticipated difficulties in implementing a process on our systems. We may have similar delays in the future, and we may not obtain any benefits from our research and development activities. Any delay or failure by us to develop and release new products or product enhancements would have a substantial adverse effect on our business and results of operations.

Our products could have defects or errors, which may give rise to claims against us, adversely affect market adoption of our systems, and adversely affect our business, financial condition, and results of operations.

Our systems utilize novel and complex technology and such systems may develop or contain undetected defects or errors. We cannot assure you that material performance problems, defects, or errors will not arise, and as we increase the density and integration of our systems, these risks may increase. We generally provide warranties that our systems will meet performance expectations and will be free from defects. The costs incurred in correcting any defects or errors may be substantial and could adversely affect our operating margins. For example, we have experienced a performance issue with respect to certain IFCs used in our C1 systems due to the presence of more than one cell in an IFC chamber. Although we have redesigned such C1 IFCs, we may experience additional unexpected product defects or errors that could affect our ability to adequately address these performance issues.

In manufacturing our products, including our systems, IFCs, and assays, we depend upon third parties for the supply of various components, many of which require a significant degree of technical expertise to produce. In addition, we purchase certain products from third-party suppliers for resale. If our suppliers fail to produce components to specification or provide defective products to us for resale and our quality control tests and procedures fail to detect such errors or defects, or if we or our suppliers use defective materials or workmanship in the manufacturing process, the reliability and performance of our products will be compromised.

If our products contain defects, we may experience:

- a failure to achieve market acceptance or expansion of our product sales;
- loss of customer orders and delay in order fulfillment;
- damage to our brand reputation;
- increased cost of our warranty program due to product repair or replacement;
- product recalls or replacements;
- inability to attract new customers;
-

diversion of resources from our manufacturing and research and development departments into our service department; and

- legal claims against us, including product liability claims, which could be costly and time consuming to defend and result in substantial damages.

In addition, certain of our products are marketed for use with products sold by third parties. For example, certain of our systems are marketed as compatible with major next-generation DNA sequencing instruments. If such third-party products are not produced to specification, are produced in accordance with modified specifications, or are defective, they may not be compatible with our products. In such case, the reliability and performance of our products may be compromised.

The occurrence of any one or more of the foregoing could negatively affect our business, financial condition, and results of operations.

Our business depends on research and development spending levels of academic, clinical, and governmental research institutions, biopharmaceutical, biotechnology, and Ag-Bio companies, and CROs, a reduction in which could limit our ability to sell our products and adversely affect our business.

We expect that our revenue in the foreseeable future will be derived primarily from sales of our systems, IFCs, assays, and reagents to academic institutions, clinical research laboratories that use our technology to develop tests, and biopharmaceutical, biotechnology, Ag-Bio companies and CROs worldwide. Our success will depend upon their demand for and use of our products. Accordingly, the spending policies of these customers could have a significant effect on the demand for our technology. These policies may be based on a wide variety of factors, including concerns regarding any future federal government budget sequestrations, the availability of resources to make purchases, the spending priorities among various types of equipment, policies regarding spending during recessionary periods, and changes in the political climate. In addition, academic, governmental, and other research institutions that fund research and development activities may be subject to stringent budgetary constraints that could result in spending reductions, reduced allocations, or budget cutbacks, which could jeopardize the ability of these customers to purchase our products. Our operating results may fluctuate substantially due to reductions and delays in research and development expenditures by these customers. For example, reductions in capital and operating expenditures by these customers may result in lower than expected sales of our systems, IFCs, assays, and reagents. These reductions and delays may result from factors that are not within our control, such as:

- changes in economic conditions;
- natural disasters;
- changes in government programs that provide funding to research institutions and companies;
- changes in the regulatory environment affecting life science and Ag-Bio companies engaged in research and commercial activities;
- differences in budget cycles across various geographies and industries;
- market-driven pressures on companies to consolidate operations and reduce costs;
- mergers and acquisitions in the life science and Ag-Bio industries; and
- other factors affecting research and development spending.

Any decrease in our customers' budgets or expenditures, or in the size, scope, or frequency of capital or operating expenditures, could materially and adversely affect our operations or financial condition.

If one or more of our manufacturing facilities become unavailable or inoperable, we will be unable to continue manufacturing our instruments, IFCs, assays and/or reagents and, as a result, our business will be harmed until we are able to secure a new facility.

We manufacture our genomics analytical and preparatory instruments and IFCs for commercial sale at our facility in Singapore, our mass cytometry instruments for commercial sale at our facility in Canada, and our assays and reagents

for commercial sale at our headquarters in the United States. No other manufacturing facilities are currently available to us, particularly facilities of the size and scope of our Singapore and Canada operations. Our facilities and the equipment we use to manufacture our instruments, IFCs, assays, and reagents would be costly to replace and could require substantial lead times to repair or replace. Our facilities may be harmed or rendered inoperable by natural or man-made disasters, which may render it difficult or impossible for us to manufacture our products for some period of time. If any of our facilities become unavailable to us, we cannot provide assurances that we will be able to secure a new manufacturing facility on acceptable terms, if at all. The inability to manufacture our products, combined with our limited inventory of manufactured supplies, may result in the loss of customers or harm our reputation, and we may be unable to reestablish relationships with those customers in the future. Although we possess insurance for damage to our property and the disruption of our business, this insurance may not be sufficient to cover

all of our potential losses and may not continue to be available to us on acceptable terms, or at all. If our manufacturing capabilities are impaired, we may not be able to manufacture and ship our products in a timely manner, which would adversely impact our business.

We generate a substantial portion of our revenue internationally and are subject to various risks relating to such international activities, which could adversely affect our sales and operating performance. In addition, any disruption or delay in the shipping or off-loading of our products, whether domestically or internationally, may have an adverse effect on our financial condition and results of operations.

During the nine months ended September 30, 2018, and 2017, and the years ended December 31, 2017, and 2016, approximately 56%, 53%, 55% and 49%, respectively, of our product and service revenue was generated from sales to customers located outside of the United States. We believe that a significant percentage of our future revenue will come from international sources as we expand our international operations and develop opportunities in other countries. Engaging in international business inherently involves a number of difficulties and risks, including:

- required compliance with existing and changing foreign regulatory requirements and laws that are or may be applicable to our business in the future, such as the RoHS and WEEE directives, which regulate the use of certain hazardous substances in, and require the collection, reuse, and recycling of waste from, products we manufacture;
- required compliance with anti-bribery laws, such as the U.S. Foreign Corrupt Practices Act and U.K. Bribery Act, data privacy requirements, labor laws, and anti-competition regulations;
- export or import restrictions;
- laws and business practices favoring local companies;
- longer payment cycles and difficulties in enforcing agreements and collecting receivables through certain foreign legal systems;
- unstable economic, political, and regulatory conditions;
- potentially adverse tax consequences, tariffs, customs charges, bureaucratic requirements, and other trade barriers;
- difficulties and costs of staffing and managing foreign operations; and
- difficulties protecting or procuring intellectual property rights.

If one or more of these risks occurs, it could require us to dedicate significant resources to remedy, and if we are unsuccessful in finding a solution, our financial results will suffer.

During June 2016, the referendum by British voters to exit the European Union ("Brexit") adversely impacted global markets and resulted in a sharp decline of the British pound sterling against the US dollar. In February 2017, the British Parliament voted in favor of allowing the British government to begin the formal process of Brexit, and the United Kingdom submitted its required notice under the applicable treaties that it intended to leave the European Union in March 2017, which initiated a negotiation process between the United Kingdom and the European Union that could last up to two years. In the short-term, volatility in the British pound sterling could continue as the United Kingdom negotiates its anticipated exit from the European Union. In the longer term, any impact from Brexit on our United Kingdom operations will depend, in part, on the outcome of tariff, trade, regulatory, and other negotiations.

A majority of our product sales are currently denominated in U.S. dollars and fluctuations in the value of the U.S. dollar relative to foreign currencies could decrease demand for our products and adversely impact our financial performance. For example, if the value of the U.S. dollar increases relative to foreign currencies, our products could become more costly to the international consumer and therefore less competitive in international markets, or if the value of the U.S. dollar decreases relative to the Singapore dollar or the Canadian dollar, it would become more costly in U.S. dollars for us to manufacture our products in Singapore and/or in Canada. Additionally, our expenses are generally denominated in the currencies of the countries in which our operations are located, which is primarily in the United States, with a portion of expenses incurred in Singapore and Canada where a significant portion of our manufacturing operations are located. Our results of operations and cash flows are, therefore,

subject to fluctuations due to changes in foreign currency exchange rates. The volatility of exchange rates depends on many factors that we cannot forecast with reliable accuracy. We have experienced and will continue to experience fluctuations in our net income or loss as a result of transaction gains or losses related to revaluing certain current asset and current liability balances that are denominated in currencies other than the functional currency of the entities in which they are recorded. For example, we experienced foreign currency gain of $0.4 million during the nine months ended September 30, 2018, and losses of $0.1 million and $1.5 million during the years ended December 31, 2017 and 2016, respectively. Fluctuations in currency exchange rates could have an adverse impact on our financial results in the future.

We rely on shipping providers to deliver products to our customers globally. Labor, tariff, or World Trade Organization-related disputes, piracy, physical damage to shipping facilities or equipment caused by severe weather or terrorist incidents, congestion at shipping facilities, inadequate equipment to load, dock, and offload our products, energy-related tie-ups, or other factors could disrupt or delay shipping or off-loading of our products domestically and internationally. Such disruptions or delays may have an adverse effect on our financial condition and results of operations.

We are dependent on single and sole source suppliers for some of the components and materials used in our products, and the loss of any of these suppliers could harm our business.

We rely on single and sole source suppliers for certain components and materials used in our products. Additionally, several of our instruments are assembled at the facilities of contract manufacturers in Singapore. We do not have long term contracts with our suppliers of these components and materials or our assembly service providers. The loss of a single or sole source supplier of any of the following components and/or materials would require significant time and effort to locate and qualify an alternative source of supply, if at all:

- The IFCs used in our microfluidic systems are fabricated using a specialized polymer, and other specialized materials, that are available from a limited number of sources. In the past, we have encountered quality issues that have reduced our manufacturing yield or required the use of additional manufacturing processes.

- Specialized pneumatic and electronic components for our C1, Callisto, Juno, and Polaris systems are available from a limited number of sources.

- The electron multiplier detector included in the Hyperion/Helios systems and certain metal isotopes used with the Hyperion/Helios systems are purchased from sole source suppliers.

- The movement stage included in the Hyperion imaging mass cytometer system is purchased from a sole source supplier.

- The nickel sampler cone used with the Hyperion/Helios systems is purchased from single source suppliers and is available from a limited number of sources.

- The raw materials for our Delta Gene and SNP Type assays and Access Array target-specific primers are available from a limited number of sources.

Our reliance on single and sole source suppliers and assembly service providers also subjects us to other risks that could harm our business, including the following:

- we may be subject to increased component or assembly costs;

- we may not be able to obtain adequate supply or services in a timely manner or on commercially reasonable terms;

- our suppliers or service providers may make errors in manufacturing or assembly of components that could negatively affect the efficacy of our products or cause delays in shipment of our products; and

- our suppliers or service providers may encounter capacity constraints or financial hardships unrelated to our demand for components or services, which could inhibit their ability to fulfill our orders and meet our requirements.

We have in the past experienced quality control and supply problems with some of our suppliers, such as manufacturing errors, and may again experience problems in the future. We may not be able to quickly establish additional or replacement

suppliers, particularly for our single source components, or assembly service providers. Any interruption or delay in the supply of components or materials or assembly of our instruments, or our inability to obtain components, materials, or assembly services from alternate sources at acceptable prices in a timely manner, could impair our ability to meet the demand of our customers and cause them to cancel orders or switch to competitive products.

Our future success is dependent upon our ability to expand our customer base and introduce new applications.

Our customer base is primarily composed of academic institutions, clinical research laboratories that use our technology to develop tests, and biopharmaceutical, biotechnology, and Ag-Bio companies that perform analyses for research and commercial purposes. Our success will depend, in part, upon our ability to increase our market share among these customers, attract additional customers outside of these markets, and market new applications to existing and new customers as we develop such applications. Attracting new customers and introducing new applications require substantial time and expense. For example, it may be difficult to identify, engage, and market to customers who are unfamiliar with the current applications of our systems. Any failure to expand our existing customer base or launch new applications would adversely affect our ability to increase our revenue.

We may not be able to develop new products or enhance the capabilities of our existing systems to keep pace with rapidly changing technology and customer requirements, which could have a material adverse effect on our business, revenue, financial condition, and operating results.

Our success depends on our ability to develop new products and applications for our technology in existing and new markets, while improving the performance and cost-effectiveness of our systems. New technologies, techniques, or products could emerge that might offer better combinations of price and performance than our current or future product lines and systems. Existing markets for our products, including high-throughput genomics, single-cell genomics and mass cytometry, as well as potential markets for our products such as high-throughput DNA sequencing and molecular applications, are characterized by rapid technological change and innovation. It is critical to our success for us to anticipate changes in technology and customer requirements and to successfully introduce new, enhanced, and competitive technology to meet our customers' and prospective customers' needs on a timely and cost-effective basis. Developing and implementing new technologies will require us to incur substantial development costs and we may not have adequate resources available to be able to successfully introduce new applications of, or enhancements to, our systems. We cannot guarantee that we will be able to maintain technological advantages over emerging technologies in the future. While we typically plan improvements to our systems, we may not be able to successfully implement these improvements. If we fail to keep pace with emerging technologies, demand for our systems will not grow and may decline, and our business, revenue, financial condition, and operating results could suffer materially. In addition, if we introduce enhanced systems but fail to manage product transitions effectively, customers may delay or forgo purchases of our systems and our operating results may be adversely affected by product obsolescence and excess inventory. Even if we successfully implement some or all of these planned improvements, we cannot guarantee that our current and potential customers will find our enhanced systems to be an attractive alternative to existing technologies, including our current products.

Impairment of our goodwill or other intangible assets could materially and adversely affect our business, operating results, and financial condition.

As of September 30, 2018, we had approximately $169.0 million of goodwill and net intangible assets, including approximately $104.1 million of goodwill and approximately $64.9 million of net intangible assets. These assets represent a significant portion of the assets recorded on our consolidated balance sheet and relate primarily to our acquisition of DVS Sciences, Inc., or DVS, in February 2014. In addition, if in the future we acquire additional businesses, technologies, or other intangible assets, a substantial portion of the value of such assets may be recorded as goodwill or intangible assets.

The carrying amounts of goodwill and intangible assets are affected whenever events or changes in circumstances indicate that their carrying amounts may not be recoverable. We review goodwill and indefinite lived intangible assets for impairment at least annually and more frequently under certain circumstances. Other intangible assets that are deemed to have finite useful lives will continue to be amortized over their useful lives but must be reviewed for impairment when events or changes in circumstances indicate that the carrying amount of these assets may not be recoverable. Events or changes in circumstances that could affect the likelihood that we will be required to recognize an impairment charge include declines in our stock price or market capitalization, declines in our market share or revenues, an increase in our losses, rapid changes in technology, failure to achieve the benefits of capacity increases and utilization, significant litigation arising out of an acquisition, or other matters. In particular, these or other adverse events or changes in circumstances may affect the estimated undiscounted future operating cash flows expected to be derived from our goodwill and intangible assets. We have recently experienced substantial declines in our stock price, and continued weakness or further declines in our stock price increase the likelihood that we may be required to

recognize impairment charges. Any impairment charges could have a material adverse effect on our operating results and net asset value in the quarter in which we recognize the impairment charge. We cannot provide assurances that we will not in the future be required to recognize impairment charges.

Our business operations are dependent upon our new senior management team and the ability of our other new employees to learn their new roles. If we are unable to recruit and retain key executives, scientists, and technical support personnel, we may be unable to achieve our goals.

Our performance is substantially dependent on the performance of our senior management, which has substantially changed over the last few years, including, for example, a change in our chief executive officer in October 2016. In addition to our chief executive officer, several other members of our senior management team have started at Fluidigm since mid-2016. As new employees gain experience in their roles, we could experience inefficiencies or a lack of business continuity due to loss of historical knowledge and a lack of familiarity of new employees with business processes, operating requirements, policies and procedures, and we may experience additional costs as new employees learn their roles and gain necessary experience. It is important to our success that these key employees quickly adapt to and excel in their new roles. If they are unable to do so, our business and financial results could be materially adversely affected. In addition, the loss of the services of any member of our senior management or our scientific or technical support staff might significantly delay or prevent the development of our products or achievement of other business objectives by diverting management's attention to transition matters and identification of suitable replacements, if any, and could have a material adverse effect on our business. Our research and product development efforts could also be delayed or curtailed if we are unable to attract, train, and retain highly skilled employees, particularly, senior scientists and engineers. We do not maintain fixed term employment contracts or significant key man life insurance with any of our employees.

Additionally, to expand our research and product development efforts, we need to retain and recruit key scientists skilled in areas such as molecular and cellular biology, assay development, and manufacturing. We also need highly trained technical support personnel with the necessary scientific background and ability to understand our systems at a technical level to effectively support potential new customers and the expanding needs of current customers. Competition for these people is intense and we may face challenges in retaining and recruiting such individuals if, for example, our stock price declines, reducing the retention value of equity awards, or our business or technology is no longer perceived as leading in our field. Because of the complex and technical nature of our systems and the dynamic market in which we compete, any failure to attract and retain a sufficient number of qualified employees could materially harm our ability to develop and commercialize our technology.

Our efficiency and cost-savings initiatives could be disruptive to our operations and adversely affect our results of operations and financial condition, and we may not realize some or all of the anticipated benefits of these initiatives in the time frame anticipated or at all.

Beginning in the first quarter of 2017, we implemented efficiency and cost-savings initiatives intended to stabilize our business operations and return to growth. We identified areas for cost efficiencies including targeted workforce reductions and optimizing our facilities, and reducing excess space. Other initiatives may also include decreasing or deferring capital expenditures and development activities. The implementation of these efficiency and cost-savings initiatives, including the impact of workforce reductions, could impair our ability to invest in developing, marketing and selling new and existing products, be disruptive to our operations, make it difficult to attract or retain employees, result in higher than anticipated charges, divert the attention of management, result in a loss of accumulated knowledge, impact our customer and supplier relationships, and otherwise adversely affect our results of operations and financial condition. In addition, our ability to complete our efficiency and cost-savings initiatives and achieve the anticipated benefits within the expected time frame is subject to estimates and assumptions and may vary materially from our expectations, including as a result of factors that are beyond our control. Furthermore, our efforts to stabilize

our business and return to growth may not be successful.

To use our products, our Biomark, EP1, and Helios/CyTOF 2 systems in particular, customers typically need to purchase specialized reagents. Any interruption in the availability of these reagents for use in our products could limit our ability to market our products.

Our products, our Biomark, EP1, and Helios systems in particular, must be used in conjunction with one or more reagents designed to produce or facilitate the particular biological or chemical reaction desired by the user. Many of these reagents are highly specialized and available to the user only from a single supplier or a limited number of suppliers. Although we sell reagents for use with certain of our products, our customers may purchase these reagents directly from third-party suppliers, and we have no control over the supply of those materials. In addition, our products are designed to work with these reagents as they

are currently formulated. We have no control over the formulation of reagents sold by third-party suppliers, and the performance of our products might be adversely affected if the formulation of these reagents is changed. If one or more of these reagents were to become unavailable or were reformulated, our ability to market and sell our products could be materially and adversely affected.

In addition, the use of a reagent for a particular process may be covered by one or more patents relating to the reagent itself, the use of the reagent for the particular process, the performance of that process, or the equipment required to perform the process. Typically, reagent suppliers, who are either the patent holders or their authorized licensees, sell the reagents along with a license or covenant not to sue with respect to such patents. The license accompanying the sale of a reagent often purports to restrict the purposes for which the reagent may be used. If a patent holder or authorized licensee were to assert against us or our customers that the license or covenant relating to a reagent precluded its use with our systems, our ability to sell and market our products could be materially and adversely affected. For example, our Biomark system involves real-time quantitative PCR, or qPCR. Leading suppliers of reagents for real-time qPCR reactions include Life Technologies Corporation (now part of Thermo Fisher Scientific) and Roche Diagnostics Corporation, who are our direct competitors, and their licensees. These real-time qPCR reagents are typically sold pursuant to limited licenses or covenants not to sue with respect to patents held by these companies. We do not have any contractual supply agreements for these real-time qPCR reagents, and we cannot assure you that these reagents will continue to be available to our customers for use with our systems, or that these patent holders will not seek to enforce their patents against us, our customers, or suppliers.

If we seek to be regulated as a medical device manufacturer by the U.S. Food and Drug Administration, or FDA, and foreign regulatory authorities, and seek approval and/or clearance for our products, the regulatory approval process would take significant time and expense and could fail to result in FDA clearance or approval for the intended uses we believe are commercially attractive. If our products were successfully approved and/or cleared, we would be subject to ongoing and extensive regulatory requirements, which would increase our costs and divert resources away from other projects. If we obtained FDA clearance or approval and we failed to comply with these requirements, our business and financial condition could be adversely impacted.

Our products are currently labeled, promoted and sold to academic institutions, life sciences laboratories, biopharmaceutical, biotechnology, Ag-Bio companies and CRO's for research use only, or RUO, and are not designed for, or intended to be used for, diagnostic tests or as medical devices as currently marketed. Before we can begin to label and market our products for use as, or in the performance of, clinical diagnostics in the United States, thereby subjecting them to FDA regulation as medical devices, we would be required to obtain premarket 510(k) clearance or premarket approval (PMA) from the FDA, unless an exception applies.

We may in the future register with the FDA as a medical device manufacturer and list some of our products with the FDA pursuant to an FDA Class I listing for general purpose laboratory equipment. We are currently assessing whether and when to make an initial registration. While this regulatory classification is exempt from certain FDA requirements, such as the need to submit a premarket notification commonly known as a 510(k), and some of the requirements of the FDA’s Quality System Regulations, or QSRs, we would be subject to ongoing FDA “general controls,” which include compliance with FDA regulations for labeling, inspections by the FDA, complaint evaluation, corrections and removals reporting, promotional restrictions, reporting adverse events or malfunctions for our products, and general prohibitions against misbranding and adulteration.

In addition, we may in the future submit 510(k) premarket notifications to the FDA to obtain FDA clearance of certain of our products on a selected basis. It is possible, in the event we elect to submit 510(k) applications for certain of our products, that the FDA would take the position that a more burdensome premarket application, such as a premarket approval application or a de novo application is required for some of our products. If such applications were required, greater time and investment would be required to obtain FDA approval. Even if the FDA agreed that a 510(k) was

appropriate, FDA clearance can be expensive and time consuming. It generally takes a significant amount of time to prepare a 510(k), including conducting appropriate testing on our products, and several months to years for the FDA to review a submission. Notwithstanding the effort and expense, FDA clearance or approval could be denied for some or all of our products. Even if we were to seek and obtain regulatory approval or clearance, it may not be for the intended uses we believe are important or commercially attractive.

If we sought and received regulatory clearance or approval for certain of our products, we would be subject to ongoing FDA obligations and continued regulatory oversight and review, including the general controls listed above and the FDA's QSRs for our development and manufacturing operations. In addition, we would be required to obtain a new 510(k) clearance before we could introduce subsequent modifications or improvements to such products. We could also be subject to additional FDA post-marketing obligations for such products, any or all of which would increase our costs and divert resources away from other

projects. If we sought and received regulatory clearance or approval and are not able to maintain regulatory compliance with applicable laws, we could be prohibited from marketing our products for use as, or in the performance of, clinical diagnostics and/or could be subject to enforcement actions, including warning letters and adverse publicity, fines, injunctions, and civil penalties; recall or seizure of products; operating restrictions; and criminal prosecution.

In addition, we could decide to seek similar regulatory clearance or approval for certain of our products in countries outside of the United States. Sales of such products outside the United States will likely be subject to foreign regulatory requirements, which can vary greatly from country to country. As a result, the time required to obtain clearances or approvals outside the United States may differ from that required to obtain FDA clearance or approval and we may not be able to obtain foreign regulatory approvals on a timely basis or at all. Clearance or approval by the FDA does not ensure approval by regulatory authorities in other countries, and approval by one foreign regulatory authority does not ensure approval by regulatory authorities in other countries or by the FDA. In Europe, we would need to comply with the Medical Device Directive 93/42 EEC and/or the In Vitro Diagnostics Directive 98/79/EC, which are required to market medical devices in the European Union. These directives have been replaced by Medical Device Regulation 2017/745 and In Vitro Diagnostic Regulation 2017/746, with official entry into force in May 26, 2017 and date of applications of May 26, 2020 and May 26, 2022 respectively. This will increase the difficulty of regulatory approvals in Europe in the future. In addition, the FDA regulates exports of medical devices. Failure to comply with these regulatory requirements or obtain and maintain required approvals, clearances and certifications could impair our ability to commercialize our products for diagnostic use outside of the United States.

Our products could become subject to regulation as medical devices by the FDA or other regulatory agencies before we have obtained regulatory clearance or approval to market our products for diagnostic purposes, which would adversely impact our ability to market and sell our products and harm our business.

As products that are currently labeled, promoted and intended for RUO, our products are not currently subject to regulation as medical devices by the FDA or comparable agencies of other countries. However, the FDA or comparable agencies of other countries could disagree with our conclusion that our products are currently intended for research use only or deem our current marketing and promotional efforts as being inconsistent with research use only products. For example, our customers may independently elect to use our research use only labeled products in their own laboratory developed tests, or LDTs, for clinical diagnostic use. The FDA has historically exercised enforcement discretion in not enforcing the medical device regulations against laboratories offering LDTs. However, on October 3, 2014, the FDA issued two draft guidance documents that set forth the FDA's proposed risk-based framework for regulating LDTs, which are designed, manufactured, and used within a single laboratory. The draft guidance documents provide the anticipated details through which the FDA would propose to establish an LDT oversight framework, including premarket review for higher-risk LDTs, such as those that have the same intended use as FDA-approved or cleared companion diagnostic tests currently on the market. In January 2017, the FDA announced that it would not issue final guidance on the oversight of LDTs and LDT manufacturers, but would seek further public discussion on an appropriate oversight approach, and give Congress an opportunity to develop a legislative solution. Any future legislative or administrative rule making or oversight of LDTs and LDT manufacturers, if and when finalized, may impact the sales of our products and how customers use our products, and may require us to change our business model in order to maintain compliance with these laws. We cannot predict how these various efforts will be resolved, how Congress or the FDA will regulate LDTs in the future, or how that regulatory system will impact our business.

Additionally, on November 25, 2013, the FDA issued Final Guidance "Distribution of In Vitro Diagnostic Products Labeled for Research Use Only." The guidance emphasizes that the FDA will review the totality of the circumstances when it comes to evaluating whether equipment and testing components are properly labeled as RUO. The final guidance states that merely including a labeling statement that the product is for research purposes only will not

necessarily render the device exempt from the FDA's clearance, approval, and other regulatory requirements if the circumstances surrounding the distribution of the product indicate that the manufacturer knows its product is, or intends for its product to be, used for clinical diagnostic purposes. These circumstances may include written or verbal marketing claims or links to articles regarding a product's performance in clinical applications and a manufacturer's provision of technical support for clinical applications.

If the FDA modifies its approach to our products labeled and intended for RUO, or otherwise determines our products or related applications should be subject to additional regulation as in vitro diagnostic devices based upon customers' use of our products for clinical diagnostic or therapeutic purposes, before we have obtained regulatory clearance or approval to market our products for diagnostic purposes, our ability to market and sell our products could be impeded and our business, prospects, results of operations and financial condition may be adversely affected. In addition, if the FDA determines that our products labeled for RUO were intended, based on a review of the totality of circumstances, for use in clinical investigation or diagnosis, those products could be considered misbranded or adulterated under the Federal Food, Drug, and Cosmetic Act and subject to recall and/or other enforcement action.

Compliance or the failure to comply with current and future regulations affecting our products and business operations worldwide, such as environmental regulations enacted in the European Union, could cause us significant expense and adversely impact our business.

We are subject to many federal, state, local, and foreign regulations relating to various aspects of our business operations. Governmental entities at all levels are continuously enacting new regulations, and it is difficult to identify all applicable regulations and anticipate how such regulations will be implemented and enforced. We continue to evaluate the necessary steps for compliance with applicable regulations. To comply with applicable regulations, we have and will continue to incur significant expense and allocate valuable internal resources to manage compliance-related issues. In addition, such regulations could restrict our ability to expand or equip our facilities, or could require us to acquire costly equipment or to incur other significant expenses to comply with the regulations. For example, the Restriction on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Directive, or RoHS, and the Waste Electrical and Electronic Equipment Directive, or WEEE, enacted in the European Union, regulate the use of certain hazardous substances in, and require the collection, reuse, and recycling of waste from, products we manufacture. Certain of our products sold in these countries are subject to WEEE and RoHS. These and similar regulations that have been or are in the process of being enacted in other countries may require us to redesign our products, use different types of materials in certain components, or source alternative components to ensure compliance with applicable standards, and may reduce the availability of parts and components used in our products by negatively impacting our suppliers' ability to source parts and components in a timely and cost-effective manner.

Any such redesigns, required use of alternative materials, or limited availability of parts and components used in our products may detrimentally impact the performance of our products, add greater testing lead times for product introductions, reduce our product margins, or limit the markets for our products, and if we fail to comply with any present and future regulations, we could be subject to future fines, penalties, and restrictions, such as the suspension of manufacturing of our products or a prohibition on the sale of products we manufacture. Any of the foregoing could adversely affect our business, financial condition, or results of operations.

If we fail to maintain effective internal control over financial reporting in the future, the accuracy and timing of our financial reporting may be impaired, which could adversely affect our business and our stock price.

The Sarbanes-Oxley Act requires, among other things, that we maintain effective internal control over financial reporting and disclosure controls and procedures. In particular, we must perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on the effectiveness of our internal control over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act. Our testing may reveal deficiencies in our internal control over financial reporting that are deemed to be material weaknesses.

Our compliance with Section 404 requires that we incur substantial accounting expense and expend significant management time on compliance-related issues. We currently do not have an internal audit group, and we continue to evaluate our need for additional accounting and financial staff with appropriate public company experience and

technical accounting knowledge. Moreover, if we do not comply with the requirements of Section 404, or if we or our independent registered public accounting firm identify deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, the market price of our stock could decline and we could be subject to sanctions or investigations by the NASDAQ Global Select Market, or NASDAQ, the SEC or other regulatory authorities, which would require additional financial and management resources.

Our future capital needs are uncertain and we may need to raise additional funds in the future, which may cause dilution to stockholders or may be upon terms that are not favorable to us.

We believe that our existing cash and cash equivalents and availability under the Revolving Credit Facility will be sufficient to meet our anticipated cash requirements for at least the next 18 months. We have continued to experience losses and, if that trend continues, we may need to seek additional sources of financing. In addition, we may need to raise substantial additional capital for various purposes, including:

- expanding the commercialization of our products;
- funding our operations;
- furthering our research and development; and
- acquiring other businesses or assets and licensing technologies.

Our future funding requirements will depend on many factors, including:

- market acceptance of our products;
- the cost of our research and development activities;
- the cost of filing and prosecuting patent applications;
- the cost of defending any litigation including intellectual property, employment, contractual or other litigation;
- the cost and timing of regulatory clearances or approvals, if any;
- the cost and timing of establishing additional sales, marketing, and distribution capabilities;
- the cost and timing of establishing additional technical support capabilities;
- fluctuations in cash demands (e.g., due to interest payments or payouts under existing cash compensation plans);
- sales variability through the year and timing of related cash collections;
- the effectiveness of our recent efficiency and cost-savings initiatives;
- the effect of competing technological and market developments; and
- the extent to which we acquire or invest in businesses, products, and technologies, although we currently have no commitments or agreements relating to any of these types of transactions.

To the extent we draw on our $15.0 million revolving senior credit facility (the “2018 Facility”) or otherwise incur additional indebtedness, the risks described above could increase. Further, if we increase our indebtedness, our actual cash requirements in the future may be greater than expected. Our cash flow from operations may not be sufficient to repay all of the outstanding debt as it becomes due, and we cannot assure you that we will be able to obtain additional funds on acceptable terms, or at all. If we raise additional funds by issuing equity securities, our stockholders may experience dilution. Debt financing in addition to the 2018 Facility, if available, may involve covenants restricting our

operations or our ability to incur additional debt. Any additional debt or equity financing that we raise may contain terms that are not favorable to us or our stockholders. If we raise additional funds through collaboration and licensing arrangements with third parties, it may be necessary to relinquish some rights to our technologies or our products, or grant licenses on terms that are not favorable to us. If we are unable to raise adequate funds, we may have to liquidate some or all of our assets, delay development or commercialization of our products, or license to third parties the rights to commercialize products or technologies that we would otherwise seek to commercialize. We also may have to reduce marketing, customer support, or other resources devoted to our products, or cease operations. Any of these factors could harm our operating results.

If we fail to comply with the covenants and other obligations under our credit facility, the lenders may be able to accelerate amounts owed under the facilities and may foreclose upon the assets securing our obligations.

In August 2018, we entered into the Revolving Credit Facility. The Revolving Credit Facility provides for secured revolving loans in an aggregate amount of up to $15.0 million. The Revolving Credit Facility is secured by substantially all of the Company's assets, other than intellectual property. The Revolving Credit Facility contains customary affirmative and negative covenants which, unless waived by the bank, limit the Company's ability to, among other things, incur additional indebtedness, grant liens, make investments, repurchase stock, pay dividends, transfer assets, enter into affiliate transactions, undergo a change of control, or engage in merger and acquisition activity, including merging or consolidating with a third party. If we fail to comply with the covenants and our other obligations under the 2018 Facility, the lenders would be able to accelerate the required repayment of amounts due under the 2018 Credit Agreement and, if they are not repaid, could foreclose upon the assets securing our obligations under the 2018 Facility.

We are subject to risks related to taxation in multiple jurisdictions and if taxing authorities disagree with our interpretations of existing tax laws or regulations, our effective income tax rate could be adversely affected and we could have additional tax liability.

We are subject to income taxes in both the United States and certain foreign jurisdictions. Significant judgments based on interpretations of existing tax laws or regulations are required in determining the provision for income taxes. For example, we have made certain interpretations of existing tax laws or regulations based upon the operations of our business internationally and we have implemented intercompany agreements based upon these interpretations and related transfer pricing analyses. If the U.S. Internal Revenue Service or other taxing authorities disagree with the positions, our effective income tax rate could be adversely affected and we could have additional tax liability, including interest and penalties. We recently completed a review of our European corporate structure and tax positions and, based upon our existing business operations, we restructured our European intercompany transactions, which increased our income tax liability. From time to time, we may review our corporate structure and tax positions in other international jurisdictions and such review may result in additional changes to how we structure our international business operations, which may adversely impact our effective income tax rate. Our effective income tax rate could also be adversely affected by changes in the mix of earnings in tax jurisdictions with different statutory tax rates, changes in the valuation of deferred tax assets and liabilities, changes in existing tax laws or tax rates, changes in the level of non-deductible expenses (including share-based compensation), changes in our future levels of research and development spending, mergers and acquisitions, or the result of examinations by various tax authorities. Legislation commonly referred to as the 2017 Tax Cuts and Jobs Act was enacted in the United States on December 22, 2017 and introduced a number of changes to U.S. federal income tax, the consequences to us of which have not yet been fully determined and which could have material impact on the value of our deferred tax assets, could result in significant one-time charges in the current or future taxable years, and could increase our future U.S. tax expense. Payment of additional amounts as a result of changes in applicable tax law or upon final adjudication of any disputes could have a material impact on our results of operations and financial position.

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

The global credit and financial markets have in recent years experienced volatility and disruptions, including diminished liquidity and credit availability, increased concerns about inflation and deflation, and the downgrade of U.S. debt and exposure risks on other sovereign debts, decreased consumer confidence, lower economic growth, volatile energy costs, increased unemployment rates, and uncertainty about economic stability. 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 governmental 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 science, Ag-Bio, and clinical research and development. Continuation or further deterioration of these financial and macroeconomic conditions could significantly harm our sales, profitability, and results of operations.

If we are unable to integrate future acquisitions successfully, our operating results and prospects could be harmed.

In addition to our acquisition of DVS, we may make additional acquisitions to improve our product offerings or expand into new markets. Our future acquisition strategy will depend on our ability to identify, negotiate, complete, and integrate acquisitions and, if necessary, to obtain satisfactory debt or equity financing to fund those acquisitions. Mergers and acquisitions are inherently risky, and any transaction we complete may not be successful. Our acquisition of DVS was our first acquisition of another company. Any merger or acquisition we may pursue would involve numerous risks, including but not limited to the following:

- difficulties in integrating and managing the operations, technologies, and products of the companies we acquire;
- diversion of our management's attention from normal daily operation of our business;
- our inability to maintain the key business relationships and the reputations of the businesses we acquire;
- our inability to retain key personnel of the acquired company;
- uncertainty of entry into markets in which we have limited or no prior experience and in which competitors have stronger market positions;
- our dependence on unfamiliar affiliates and customers of the companies we acquire;
- insufficient revenue to offset our increased expenses associated with acquisitions;
- our responsibility for the liabilities of the businesses we acquire, including those which we may not anticipate; and
- our inability to maintain internal standards, controls, procedures, and policies.

We may be unable to secure the equity or debt funding necessary to finance future acquisitions on terms that are acceptable to us. If we finance acquisitions by issuing equity or convertible debt securities, our existing stockholders will likely experience dilution, and if we finance future acquisitions with debt funding, we will incur interest expense and may have to comply with financial covenants and secure that debt obligation with our assets.

If we are unable to expand our direct sales and marketing force or distribution capabilities to adequately address our customers' needs, our business may be adversely affected.

We may not be able to market, sell, and, distribute our products effectively enough to support our planned growth. We sell our products primarily through our own sales force and through distributors in certain territories. Our future sales will depend in large part on our ability to continue to develop and substantially expand our direct sales force and to increase the scope of our marketing efforts. Our products are technically complex and used for highly specialized applications. As a result, we believe it is necessary to continue to develop a direct sales force that includes people with specific scientific backgrounds and expertise, and a marketing group with technical sophistication. Competition for such employees is intense. In addition, we have experienced significant changes in our sales organization in recent quarters due to reorganizations and changes in leadership. We may not be able to attract and retain personnel or be able to build an efficient and effective sales and marketing force, which would negatively impact sales of our products and reduce our revenue and profitability.

In addition, we may continue to enlist one or more sales representatives and distributors to assist with sales, distribution, and customer support globally or in certain regions of the world. If we do seek to enter into such arrangements, we may not be successful in attracting desirable sales representatives and distributors, or we may not be

able to enter into such arrangements on favorable terms. If our sales and marketing efforts, or those of any third-party sales representatives and distributors, are not successful, our technologies and products may not gain market acceptance, which would materially and adversely impact our business operations.

If we seek to implement a company-wide implementation of an enterprise resource planning, or ERP, system, such implementation could adversely affect our business and results of operations or the effectiveness of internal control over financial reporting.

We have considered implementing a company-wide ERP system to handle the business and financial processes within our operations and corporate functions. ERP implementations are complex and time-consuming projects that involve substantial expenditures on system software and implementation activities that can continue for several years. ERP implementations also

require transformation of business and financial processes in order to reap the benefits of the ERP system. If we decide to implement a company-wide ERP system, our business and results of operations could be adversely affected if we experience operating problems and/or cost overruns during the ERP implementation process, or if the ERP system and the associated process changes do not give rise to the benefits that we expect. If we do not effectively implement the ERP system as planned or if the system does not operate as intended, our business, results of operations, and internal controls over financial reporting could be adversely affected.

Changes in accounting principles, or interpretations thereof, could have a significant impact on our financial position and results of operations.

We prepare our consolidated financial statements in accordance with accounting principles generally accepted in the United States of America, referred to as U.S. GAAP. These principles are subject to interpretation by the SEC and various bodies formed to interpret and create appropriate accounting principles. A change in these principles can have a significant effect on our reported results and may even retroactively affect previously reported transactions. Additionally, the adoption of new or revised accounting principles may require that we make significant changes to our systems, processes and controls.

For example, the U.S.-based Financial Accounting Standards Board, referred to as FASB, is currently working together with the International Accounting Standards Board, referred to IASB, on several projects to further align accounting principles and facilitate more comparable financial reporting between companies who are required to follow U.S. GAAP under SEC regulations and those who are required to follow International Financial Reporting Standards outside of the United States. These efforts by the FASB and IASB may result in different accounting principles under U.S. GAAP that may result in materially different financial results for us in areas including, but not limited to, principles for recognizing revenue and lease accounting. Additionally, significant changes to U.S. GAAP resulting from the FASB's and IASB's efforts may require that we change how we process, analyze and report financial information and that we change financial reporting controls. Additionally, the FASB issued new guidance (ASU 2014-09) relating to Revenue from Contracts with Customers which supersedes nearly all existing U.S. GAAP revenue recognition guidance. The new guidance is effective for our fiscal year 2018. We adopted ASU 2014-09 in the first quarter of 2018 using the modified retrospective method. The adoption is not expected to have a material impact on our consolidated financial statements. Under the modified retrospective method, periods prior to the adoption of ASU 2014-09 are not restated and the cumulative effect of initially applying the new standard is reflected in the opening balance of retained earnings as of January 1, 2018. Additional disclosures are required for significant differences between the reported results under the new standard and those that would have been reported under the legacy standard. While we continue to evaluate the effect of the new standard on our ongoing financial reporting, we currently do not expect the cumulative effect of the new standard to be material. We continue to identify the appropriate changes to our business processes, systems, and controls to support revenue recognition and disclosure under the new standard.

It is not clear if or when these potential changes in accounting principles may become effective, whether we have the proper systems and controls in place to accommodate such changes and the impact that any such changes may have on our financial position and results of operations.

Our ability to use net operating loss carryforwards to offset future taxable income for U.S. federal income tax purposes and other tax benefits may be limited.

Section 382 of the Internal Revenue Code of 1986, as amended, referred to as the "Code," imposes an annual limitation on the amount of taxable income that may be offset if a corporation experiences an "ownership change" as defined in Section 382 of the Code. An ownership change occurs when a company's "five-percent shareholders" (as defined in Section 382 of the Code) collectively increase their ownership in the company by more than 50 percentage points (by

value) over a rolling three-year period. Additionally, various states have similar limitations on the use of state net operating losses, referred to as our NOL's, following an ownership change.

If we experience an ownership change, our ability to use our NOLs, any loss or deduction attributable to a “net unrealized built-in loss” and other tax attributes, which we refer to as tax benefits, could be substantially limited, and the timing of the usage of the tax benefits could be substantially delayed, which could significantly impair the value of the tax benefits. There is no assurance that we will be able to fully utilize the tax benefits and we could be required to record an additional valuation allowance related to the amount of the tax benefits that may not be realized, which could adversely impact our results of operations.

We believe that these tax benefits are a valuable asset for us. However, legislation commonly known as the 2017 Tax Cuts and Jobs Act includes a decrease in the U.S. federal corporate income tax rate from 35% to 21%, and our tax benefits were

revalued at the newly enacted rate. We do not expect this to have a material impact on our financial statements because we currently maintain a full valuation allowance on our U.S. deferred tax assets; however, this reduction in the U.S. federal corporate income tax rate results in a corresponding reduction in the value of our tax benefits. On November 21, 2016, our board of directors approved a tax benefit preservation plan, or Tax Benefit Preservation Plan, in an effort to protect our tax benefits during the effective period of the tax benefit preservation plan. Our board of directors elected to let the Tax Benefit Preservation Plan expire in August 2017 based on its determination, in consultation with our management and tax advisors, that our NOLs were not at material risk of limitation based on an ownership change pursuant to Section 382. Our board of directors will continue to monitor our NOLs, however, and could elect to adopt a similar plan if it believes a potential risk exists that our NOLs could be limited. Any future tax benefit preservation plan could make it more difficult for a third party to acquire, or could discourage a third party from acquiring, us or a large block of our common stock.

We have a significant amount of outstanding indebtedness, and our financial condition and results of operations could be adversely affected if we do not efficiently manage our liabilities.

As of September 30, 2018, we had outstanding $150.0 million aggregate principal amount of our 2018 Notes and $51.3 million aggregate principal amount of our 2014 Notes. This significant amount of debt has important risks to us and our investors, including:

- requiring a portion of our cash flow from operations to make interest payments on this debt;
- increasing our vulnerability to general adverse economic and industry conditions;
- reducing the cash flow available to fund capital expenditures and other corporate purposes and to grow our business;
- limiting our flexibility in planning for, or reacting to, changes in our business and the industry; and
- limiting our ability to borrow additional funds as needed or take advantage of business opportunities as they arise.

In addition, to the extent we draw on our Revolving Credit Facility or otherwise incur additional indebtedness, the risks described above could increase. Further, if we increase our indebtedness, our actual cash requirements in the future may be greater than expected. Our cash flow from operations may not be sufficient to repay all of the outstanding debt as it becomes due, and we may not be able to borrow money, sell assets or otherwise raise funds on acceptable terms, or at all, to refinance our debt.

Risks Related to 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. 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. 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. In addition, competitors may be able to design alternative methods or devices that avoid infringement of our patents. Both the patent application process and the process of managing patent disputes can be time consuming and expensive.

Furthermore, the laws of some foreign countries may not protect our intellectual property rights to the same extent as do the laws of the United States, and many companies have encountered significant problems in protecting and defending such rights in foreign jurisdictions. 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. Changes in either the patent laws or in interpretations of patent laws in the United States or other countries may diminish the value of our intellectual property. 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;
- The patents of others may have an adverse effect on our business; and
- Others may independently develop similar or alternative products and technologies or duplicate any of our products and technologies.

To the extent our intellectual property, including licensed intellectual property, offers inadequate protection, or is found to be invalid or unenforceable, our competitive position and our business could be adversely affected.

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, any of which could be time-intensive and costly and may adversely impact our business or stock price.

Litigation may be necessary for us to enforce our patent and proprietary rights, determine the scope, coverage, and validity of others' proprietary rights, and/or defend against third party claims of intellectual property infringement against us as well as against our suppliers, distributors, customers, and other entities with whom we do business. Litigation could result in substantial legal fees and could adversely affect the scope of our patent protection. The outcome of any litigation or other proceeding is inherently uncertain and might not be favorable to us, and we might

not be able to obtain licenses to technology that we require. Even if such licenses are obtainable, they may not be available at a reasonable cost. We could therefore incur substantial costs related to royalty payments for licenses obtained from third parties, which could negatively affect our product margins or financial position. Further, we could encounter delays in product introductions, or interruptions in product sales, as we develop alternative methods or products.

As we move into new markets and applications for our products, incumbent participants in such markets may assert their patents and other proprietary rights against us as a means of impeding our entry into such markets or as a means to extract substantial license and royalty payments from us. Our commercial success may depend in part on our non-infringement of the patents or proprietary rights of third parties. Numerous significant intellectual property issues have been litigated, and will likely continue to be litigated, between existing and new participants in our existing and targeted markets. For example, some of our products provide for the testing and analysis of genetic material, and patent rights relating to genetic materials remain a developing area of patent law. A recent U.S. Supreme Court decision held, among other things, that claims to isolated genomic

DNA occurring in nature are not patent eligible, while claims relating to synthetic DNA may be patent eligible. We expect the ruling will result in additional litigation in our industry. In addition, third parties may assert that we are employing their proprietary technology without authorization, and if they are successful in making such claims, we may be forced to enter into license agreements, pay additional royalties or license fees, or enter into settlements that include monetary obligations or restrictions on our business.

Our customers have been sued for various claims of intellectual property infringement in the past, and we expect that our customers will be involved in additional litigation in the future. In particular, our customers may become subject to lawsuits claiming that their use of our products infringes third-party patent rights, and we could become subject to claims that we contributed to or induced our customer's infringement. 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 be subject to damages resulting from claims that we or our employees have wrongfully used or disclosed alleged trade secrets of our employees' former employers or other institutions or third parties with whom such employees may have been previously affiliated.

Many of our employees were previously employed at universities or other life science or Ag-Bio companies, including our competitors or potential competitors. In the future, we may become subject to claims that our employees, or we, have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers or other third parties or institutions with whom our employees may have been previously affiliated. Litigation may be necessary to defend against these claims. For example, we were a defendant in litigation brought against us and one of our non-executive employees by Thermo Fisher Scientific Inc. (Thermo) alleging, among other claims, misappropriation of proprietary information and breach of contractual and fiduciary obligations. While we resolved our dispute with Thermo in July 2017, if we fail in defending against similar claims brought in the future we could be subject to injunctive relief against us. A loss of key research personnel work product could hamper or prevent our ability to commercialize certain potential products or a loss of or inability to hire key marketing, sales or research and development personnel could adversely affect our future product development, sales and revenues, any of which could severely harm our business. Even if we are successful in defending against any similar claims brought in the future, litigation could result in substantial costs and be a distraction to management.

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, which would have an adverse effect on our business.

We rely on licenses in order to be able to use various proprietary technologies that are material to our business, including our core IFC, multi-layer soft lithography, and mass cytometry technologies. In some cases, we do not control the prosecution, maintenance, or filing of the patents to which we hold licenses, or the enforcement of these patents against third parties. Additionally, our business and product development plans anticipate and may substantially depend on future in-license agreements with additional third parties, some of which are currently in the early discussion phase. For example, Fluidigm Canada Inc., or Fluidigm Canada, an Ontario corporation and wholly-owned subsidiary of Fluidigm Sciences, was party to an interim license agreement, now expired, with Nodality, Inc., or Nodality, under which Nodality granted Fluidigm Canada a worldwide, non-exclusive, research use only, royalty bearing license to certain cytometric reagents, instruments, and other products. While we were able to secure a license under a new license agreement with Nodality, we cannot provide assurances that we will always be

able to obtain suitable license rights to technologies or intellectual property of other third parties on acceptable terms, if at all.

In-licensed intellectual property rights that are fundamental to the business being operated present numerous risks and limitations. For example, all or a portion of the license rights granted may be limited for research use only, and in the event we attempt to expand into diagnostic applications, we would be required to negotiate additional rights, which may not be available to us on commercially reasonable terms, if at all.

Our rights to use the technology we license are also subject to the negotiation and continuation of those licenses. Certain of our licenses contain provisions that allow the licensor to terminate the license upon specific conditions. Our rights under the licenses are subject to our continued compliance with the terms of the license, including the payment of royalties due under the

license. 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 and the license is terminated, we might be barred from marketing, producing, and selling some or all of our products, which would have an adverse effect on our business. Potential disputes between us and one of our existing licensors concerning the terms or conditions of the applicable license agreement could result, among other risks, in substantial management distraction; increased expenses associated with litigation or efforts to resolve disputes; substantial customer uncertainty concerning the direction of our product lines; potential infringement claims against us and/or our customers, which could include efforts by a licensor to enjoin sales of our products; customer requests for indemnification by us; and, in the event of an adverse determination, our inability to operate our business as currently operated. Termination of material license agreements could prevent us from manufacturing and selling our products unless we can negotiate new license terms or develop or acquire alternative intellectual property rights that cover or enable similar functionality. Any of these factors would be expected to have a material adverse effect on our business, operating results, and financial condition and could result in a substantial decline in our stock price.

We are subject to certain manufacturing restrictions related to licensed technologies that were developed with the financial assistance of U.S. governmental grants.

We are subject to certain U.S. government regulations because we have licensed technologies that were developed with U.S. government grants. In accordance with these regulations, these licenses provide that products embodying the technologies are subject to domestic manufacturing requirements. If this domestic manufacturing requirement is not met, the government agency that funded the relevant grant is entitled to exercise specified rights, referred to as “march-in rights,” which if exercised would allow the government agency to require the licensors or us to grant a non-exclusive, partially exclusive, or exclusive license in any field of use to a third party designated by such agency. All of our microfluidic systems revenue is dependent upon the availability of our IFCs, which incorporate technology developed with U.S. government grants. Our genomics instruments, including microfluidic systems, and IFCs are manufactured at our facility in Singapore. The federal regulations allow the funding government agency to grant, at the request of the licensors of such technology, a waiver of the domestic manufacturing requirement. Waivers may be requested prior to any government notification. We have assisted the licensors of these technologies with the analysis of the domestic manufacturing requirement, and, in December 2008, the sole licensor subject to the requirement applied for a waiver of the domestic manufacturing requirement with respect to the relevant patents licensed to us by this licensor. In July 2009, the funding government agency granted the requested waiver of the domestic manufacturing requirement for a three-year period commencing in July 2009. In June 2012, the licensor requested a continued waiver of the domestic manufacturing requirement with respect to the relevant patents, but the government agency has not yet taken any action in response to this request. If the government agency does not grant the requested waiver or the government fails to grant additional waivers of such requirement that may be sought in the future, then the U.S. government could exercise its march-in rights with respect to the relevant patents licensed to us. In addition, the license agreement under which the relevant patents are licensed to us contains provisions that obligate us to comply with this domestic manufacturing requirement. We are not currently manufacturing instruments and IFCs in the United States that incorporate the relevant licensed technology. If our lack of compliance with this provision constituted a material breach of the license agreement, the license of the relevant patents could be terminated or we could be compelled to relocate our manufacturing of microfluidic systems and IFCs to the United States to avoid or cure a material breach of the license agreement. Any of the exercise of march-in rights, the termination of our license of the relevant patents or the relocation of our manufacturing of microfluidic systems and IFCs to the United States could materially adversely affect our business, operations and financial condition.

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We may be subject to information technology failures, including data protection breaches and cyber-attacks, that could disrupt our operations, damage our reputation and adversely affect our business, operations, and financial results.

We rely on our information technology systems for the effective operation of our business and for the secure maintenance and storage of confidential data relating to our business and third-party businesses. Although we have implemented security controls to protect our information technology systems, experienced programmers or hackers may be able to penetrate our security controls, and develop and deploy viruses, worms, and other malicious software programs that compromise our confidential information or that of third parties and cause a disruption or failure of our information technology systems. Any such compromise of our information technology systems could result in the unauthorized publication of our confidential business or proprietary information, result in the unauthorized release of customer, supplier or employee data, result in a violation of privacy or other laws, expose us to a risk of litigation, or damage our reputation. The cost and operational consequences of implementing further data protection measures either as a response to specific breaches or as a result of evolving risks, could be significant. In addition, our inability to use or access our information systems at critical points in time could adversely affect the timely and efficient operation of our business. Any delayed sales, significant costs or lost customers resulting from these technology failures could adversely affect our business, operations, and financial results.

Third parties with which we conduct business have access to certain portions of our sensitive data. In the event that these third parties do not properly safeguard our data that they hold, security breaches could result and negatively impact our business, operations, and financial results.

We are subject to certain obligations and restrictions relating to technologies developed in cooperation with Canadian government agencies.

Some of our Canadian research and development is funded in part through government grants and by government agencies. The intellectual property developed through these projects is subject to rights and restrictions in favor of government agencies and Canadians generally. In most cases the government agency retains the right to use intellectual property developed through the project for non-commercial purposes and to publish the results of research conducted in connection with the project. This may increase the risk of public disclosure of information relating to our intellectual property, including confidential information, and may reduce its competitive advantage in commercializing intellectual property developed through these projects. In certain projects, we have also agreed to use commercially reasonable efforts to commercialize intellectual property in Canada, or more specifically in the province of Ontario, for the economic benefit of Canada and the province of Ontario. These restrictions will limit our choice of business and manufacturing locations, business partners and corporate structure and may, in certain circumstances, restrict our ability to achieve maximum profitability and cost efficiency from the intellectual property generated by these projects. In one instance, a dispute with the applicable government funded entity may require mediation, which could lead to unanticipated delays in our commercialization efforts to that project. One of our Canadian government funded projects is also subject to certain limited “march-in” rights in favor of the government of the Province of Ontario, under which we may be required to grant a license to our intellectual property, including background intellectual property developed outside the scope of the project, to a responsible applicant on reasonable terms in circumstances where the government determines that such a license is necessary in order to alleviate emergency or extraordinary health or safety needs or for public use. In addition, we must provide reasonable assistance to the government in obtaining similar licenses from third parties required in connection with the use of its intellectual property. Instances in which the government of the Province of Ontario has exercised similar “march-in” rights are rare; however, the exercise of such rights could materially adversely affect our business, operations and financial condition.

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Risks Related to Our Common Stock

Our stock price may fluctuate significantly, particularly if holders of substantial amounts of our stock attempt to sell, and holders may have difficulty selling their shares based on current trading volumes of our stock. In addition, numerous other factors could result in substantial volatility in the trading price of our stock.

Our stock is currently traded on NASDAQ, but we can provide no assurance that we will be able to maintain an active trading market on NASDAQ or any other exchange in the future. The trading volume of our stock tends to be low relative to our total outstanding shares, and we have several stockholders who hold substantial blocks of our stock. As of September 30, 2018, we had 39,315,785 shares of common stock outstanding, and stockholders holding at least 5% of our stock, individually or with affiliated persons or entities, collectively beneficially owned or controlled approximately 70.4% of such shares and one stockholder beneficially owned 32.4% of our outstanding common stock. Sales of large numbers of shares by any of our large stockholders could adversely affect our trading price, particularly given our relatively small historic trading volumes. If stockholders holding shares of our common stock sell, indicate an intention to sell, or if it is perceived that they will sell, substantial amounts of their common stock in the public market, the trading price of our common stock could decline. Moreover, if there is no active trading market or if the volume of trading is limited, holders of our common stock may have difficulty selling their shares. In addition, the concentration of ownership of our outstanding common stock (approximately 70.4% held by our top five stockholders as of September 30, 2018) means that a relatively small number of stockholders have significant control over the outcomes of stockholder voting.

In addition, the trading price of our common stock may be highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control. These factors include:

- actual or anticipated quarterly variation in our results of operations or the results of our competitors;
- announcements or communications by us or our competitors relating to, among other things, new commercial products, technological advances, significant contracts, commercial relationships, capital commitments, acquisitions or sales of businesses, and/or misperceptions in or speculation by the market regarding such announcements or communications;
- issuance of new or changed securities analysts' reports or recommendations for our stock;
- developments or disputes concerning our intellectual property or other proprietary rights;
- commencement of, or our involvement in, litigation;
- market conditions in the life science, Ag-Bio, and CRO sectors;
- failure to complete significant sales;
- manufacturing disruptions that could occur if we were unable to successfully expand our production in our current or an alternative facility;
- any future sales of our common stock or other securities in connection with raising additional capital or otherwise;
- any major change to the composition of our board of directors or management; and
- general economic conditions and slow or negative growth of our markets.

The stock market in general, and market prices for the securities of technology-based companies like ours in particular, have from time to time experienced volatility that often has been unrelated to the operating performance of the underlying companies. These broad market and industry fluctuations may adversely affect the market price of our common stock regardless of our operating performance. In several recent situations where the market price of a stock has been volatile, holders of that stock have instituted securities class action litigation against the company that issued the stock. If any of our stockholders were to bring a lawsuit against us, the defense and disposition of the lawsuit could be costly and divert the time and attention of our management and harm our operating results.

If securities or industry analysts publish unfavorable research about our business or cease to cover our business, our stock price and/or trading volume could decline.

The trading market for our common stock may rely, in part, on the research and reports that equity research analysts publish about us and our business. We do not have any control of the analysts or the content and opinions included in their reports. The price of our stock could decline if one or more equity research analysts downgrade our stock or issue other unfavorable commentary or research. If one or more equity research analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which in turn could cause our stock price or trading volume to decline.

Anti-takeover provisions in our charter documents and under Delaware law could make an acquisition of us, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management and limit the market price of our common stock.

Provisions in our certificate of incorporation and bylaws may have the effect of delaying or preventing a change of control or changes in our management, including provisions that:

- authorize our board of directors to issue, without further action by the stockholders, up to 10,000,000 shares of undesignated preferred stock;
- require that any action to be taken by our stockholders be effected at a duly called annual or special meeting and not by written consent;
- specify that special meetings of our stockholders can be called only by our board of directors, the chairman of the board, the chief executive officer or the president;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our board of directors;
- establish that our board of directors is divided into three classes, Class I, Class II, and Class III, with each class serving staggered three year terms;
- provide that our directors may be removed only for cause;
- provide 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;
- specify that no stockholder is permitted to cumulate votes at any election of directors; and
- require a super-majority of votes to amend certain of the above-mentioned provisions.

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, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which limits the ability of stockholders owning in excess of 15% of our outstanding voting stock to merge or combine with us.

We have never paid cash dividends on our capital stock, and we do not anticipate paying any cash dividends in the foreseeable future.

We have paid no cash dividends on any of our classes of capital stock to date and currently intend to retain our future earnings to fund the development and growth of our business. In addition, we cannot pay any cash dividends on any of our classes of common stock without approval from the lender under our 2018 Credit Facility, and may become subject to covenants under future debt arrangements that place restrictions on our ability to pay dividends. As a result, capital appreciation, if any, of our common stock will be stockholders' sole source of gain for the foreseeable future.

Risks Related to Our Outstanding Convertible Notes

Our outstanding convertible notes are effectively subordinated to our secured debt and any liabilities of our subsidiaries.

Our outstanding 2014 Notes and 2018 Notes, which, collectively, we refer to as our "Notes", rank:

- senior in right of payment to any of our indebtedness that is expressly subordinated in right of payment to the Notes;
- equal in right of payment to all of our liabilities that are not so subordinated;
- effectively junior in right of payment to any of our secured indebtedness, including, but not limited to, any indebtedness under the Revolving Credit Facility, to the extent of the value of the assets securing such indebtedness; and
- structurally junior to all indebtedness and other liabilities (including trade payables) of our subsidiaries.

In February 2014, we completed the offering of our 2014 Notes with an aggregate outstanding principal amount of $201.3 million. In March 2018, we completed an exchange of $150.0 million in aggregate principal amount of our 2014 Notes for $150.0 million in aggregate principal amount of our 2018 Notes, leaving approximately $51.3 million in aggregate principal amount of 2014 Notes outstanding. In the event of our bankruptcy, liquidation, reorganization, or other winding up, our assets that secure debt ranks senior in right of payment to Notes will be available to pay obligations on the Notes only after the secured debt, including, but not limited to, any indebtedness under the Revolving Credit Facility, has been repaid in full from these assets, and the assets of our subsidiaries will be available to pay obligations on the Notes only after all claims senior to the Notes have been repaid in full. There may not be sufficient assets remaining to pay amounts due on any or all of the Notes then outstanding. The indentures governing the Notes do not prohibit us from incurring additional senior debt or secured debt, nor do they prohibit our subsidiaries from incurring additional liabilities.

The Notes are our obligations only and some of our operations are conducted through, and a portion of our consolidated assets are held by, our subsidiaries.

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

Recent and future regulatory actions and other events may adversely affect the trading price and liquidity of the Notes.

We expect that many investors in, and potential purchasers of, the Notes will employ, or seek to employ, a convertible arbitrage strategy with respect to the Notes. Investors would typically implement such a strategy by selling short the common stock underlying the Notes and dynamically adjusting their short position while continuing to hold the Notes. Investors may also implement this type of strategy by entering into swaps on our common stock in lieu of or in addition to short selling the common stock. As a result, any specific rules regulating equity swaps or short selling of

securities or other governmental action that interferes with the ability of market participants to effect short sales or equity swaps with respect to our common stock could adversely affect the ability of investors in, or potential purchasers of, the Notes to conduct the convertible arbitrage strategy that we believe they will employ, or seek to employ, with respect to the Notes. This could, in turn, adversely affect the trading price and liquidity of the Notes.

The SEC and other regulatory and self-regulatory authorities have implemented various rules and taken certain actions, and may in the future adopt additional rules and take other actions, that may impact those engaging in short selling activity involving equity securities (including our common stock). Such rules and actions include Rule 201 of SEC Regulation SHO, the adoption by the Financial Industry Regulatory Authority, Inc. and the national securities exchanges of a “Limit Up-Limit Down” program, the imposition of market-wide circuit breakers that halt trading of securities for certain periods following specific market declines, and the implementation of certain regulatory reforms required by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. Although the direction and magnitude of the effect that Regulation SHO, FINRA, securities exchange rule changes, and implementation of the Dodd-Frank Act may have on the trading price and the liquidity of the Notes will depend on a variety

of factors, many of which cannot be determined at the date of this report, past regulatory actions (such as certain emergency orders issued by the SEC in 2008 prohibiting short sales of stock of certain financial services companies) have had a significant impact on the trading prices and liquidity of convertible debt instruments. Any governmental or regulatory action that restricts the ability of investors in, or potential purchasers of, the Notes to effect short sales of our common stock, borrow our common stock, or enter into swaps on our common stock or increases the costs of implementing an arbitrage strategy could adversely affect the trading price and the liquidity of the Notes.

Volatility in the market price and trading volume of our common stock could adversely impact the trading price of the Notes.

The stock market in recent years has experienced significant price and volume fluctuations that have often been unrelated to the operating performance of companies. The market price of our common stock could fluctuate significantly for many reasons, including in response to the risks described in this report, or for reasons unrelated to our operations, such as reports by industry analysts, investor perceptions or negative announcements by our customers, competitors or suppliers regarding their own performance, as well as industry conditions and general financial, economic and political instability. The market price of our common stock could also decline as a result of sales of a large number of shares of our common stock in the market, particularly sales by our directors, executive officers, employees, and significant stockholders, and the perception that these sales could occur may also depress the market price of our common stock. A decrease in the market price of our common stock would likely adversely impact the trading price of the Notes. The market price of our common stock could also be affected by possible sales of our common stock by investors who view the Notes as a more attractive means of equity participation in us and by hedging or arbitrage trading activity that we expect to develop involving our common stock. This trading activity could, in turn, affect the trading price of the Notes.

We have incurred additional debt and may still incur substantially more debt or take other actions which would intensify the risks discussed above.

We are not restricted under the terms of the indentures governing the Notes from incurring additional debt, securing existing or future debt, recapitalizing our debt, or taking a number of other actions that are not limited by the terms of the indentures governing the Notes that could have the effect of diminishing our ability to make payments on the Notes when due. Any failure by us or any of our significant subsidiaries to make any payment at maturity of indebtedness for borrowed money in excess of $15 million or the acceleration of any such indebtedness in excess of $15 million would, subject to the terms of the applicable indenture governing the Notes, constitute a default under the indenture. If the repayment of the related indebtedness were to be accelerated after any applicable notice or grace periods, we may not have sufficient funds to repay the Notes when required.

In August 2018, we entered into the Revolving Credit Facility with Silicon Valley Bank, which matures on August 2, 2020. Amounts drawn under the Revolving Credit Facility will be used for working capital and general corporate purposes. While we currently have no outstanding debt under the Revolving Credit Facility, we may incur up to $15.0 million of secured debt pursuant to the Revolving Credit Facility . See Note 4 to the Condensed Consolidated Financial Statements included in this Form 10-Q for more information about the Revolving Credit Facility.

We may not have the ability to raise the funds necessary to repurchase the Notes upon specified dates or upon a fundamental change, and our future debt may contain limitations on our ability to repurchase the Notes.

Holders of the Notes have the right to require us to repurchase all or a portion of their Notes on certain dates or upon the occurrence of a fundamental change at a repurchase price equal to, for the 2014 Notes, 100% of the principal amount of the 2014 Notes to be repurchased or, for 2018 Notes, 100% of the accreted principal amount (i.e., up to 120% of the outstanding principal amount) of the 2018 Notes to be repurchased, plus, in each case, accrued and

unpaid interest, if any. We may not have enough available cash or be able to obtain financing at the time we are required to make repurchases of Notes surrendered therefor.

In addition, our ability to repurchase the Notes may be limited by law, regulatory authority, or agreements governing our future indebtedness. Our failure to repurchase Notes at a time when the repurchase is required by the applicable indenture would constitute a default under the applicable indenture. A default under the applicable indenture or the fundamental change itself could also lead to a default under agreements governing our future indebtedness. If the repayment of the related indebtedness were to be accelerated after any applicable notice or grace periods, we may not have sufficient funds to repay the indebtedness and repurchase the Notes when required.

Holders of Notes are not entitled to any rights with respect to our common stock, but they are subject to all changes made with respect to them to the extent our conversion obligation includes shares of our common stock.

Holders of Notes are not entitled to any rights with respect to our common stock (including, without limitation, voting rights and rights to receive any dividends or other distributions on our common stock) prior to the conversion date with respect to any Notes they surrender for conversion, but they are subject to all changes affecting our common stock. For example, if an amendment is proposed to our certificate of incorporation or bylaws requiring stockholder approval and the record date for determining the stockholders of record entitled to vote on the amendment occurs prior to the conversion date with respect to any Notes surrendered for conversion, then the holder surrendering such Notes will not be entitled to vote on the amendment, although such holder will nevertheless be subject to any changes affecting our common stock.

We have made only limited covenants in the indentures governing the Notes, and these limited covenants may not protect a noteholder's investment.

The indentures governing the Notes do not:

- require us to maintain any financial ratios or specific levels of net worth, revenues, income, cash flows, or liquidity and, accordingly, does not protect holders of the Notes in the event that we experience adverse changes in our financial condition or results of operations;
- limit our subsidiaries' ability to guarantee or incur indebtedness that would rank structurally senior to the Notes;
- limit our ability to incur additional indebtedness, including secured indebtedness;
- restrict our subsidiaries' ability to issue securities that would be senior to our equity interests in our subsidiaries and therefore would be structurally senior to the Notes;
- restrict our ability to repurchase our securities;
- restrict our ability to pledge our assets or those of our subsidiaries; or
- restrict our ability to make investments or pay dividends or make other payments in respect of our common stock or our other indebtedness.

Furthermore, the indentures governing the Notes contain only limited protections in the event of a change of control. We could engage in many types of transactions, such as acquisitions, refinancings, or certain recapitalizations, that could substantially affect our capital structure and the value of the Notes and our common stock but may not constitute a "fundamental change" that permits holders to require us to repurchase their Notes or a "make-whole fundamental change" that permits holders to convert their Notes at an increased conversion rate. For these reasons, the limited covenants in the indentures governing the Notes may not protect a noteholder's investment in the Notes.

The increase in the conversion rate for Notes converted in connection with a make-whole fundamental change or provisional redemption may not adequately compensate noteholders for any lost value of the Notes as a result of such transaction or redemption.

In the case of the 2014 Notes, if (i) a make-whole fundamental change occurs prior to February 6, 2021, or (ii) upon our issuance of a notice of provisional redemption, under certain circumstances, we will increase the conversion rate

by a number of additional shares of our common stock for the 2014 Notes converted in connection with such events. In the case of the 2018 Notes, if (i) a make-whole fundamental change occurs prior to February 6, 2023, or (ii) upon voluntary conversion of the 2018 Notes prior to the issuance of a notice of provisional redemption, under certain circumstances, we will increase the conversion rate by a number of additional shares of our common stock for the 2018 Notes converted in connection with such events. The increase in the conversion rate for Notes converted in connection with such events may not adequately compensate noteholders for any lost value of the notes as a result of such transaction or redemption. In addition, if the price of our common stock in the transaction is greater than (i) $180.00 per share (in the case of the 2014 Notes) or (ii) $100 per share (in the case of the 2018 Notes) or (i) less than $39.96 per share (in the case of the 2014 Notes) or (ii) less than $2.00 per share (in the case of the 2018 Notes) (in each case, subject to adjustment), no additional shares will be added to the conversion rate for the applicable series of notes. Moreover, in no event will the conversion rate per $1,000 principal amount of Notes as a result of this adjustment exceed

(i) 25.0250 shares of common stock (in the case of the 2014 Notes) and (ii) 134.9730 shares of common stock (in the case of the 2018 Notes), in each case, subject to adjustment.

Our obligation to increase the conversion rate for Notes converted in connection with such events could be considered a penalty, in which case the enforceability thereof would be subject to general principles of reasonableness and equitable remedies.

The conversion rate of the Notes may not be adjusted for all dilutive events.

The conversion rate of the Notes is subject to adjustment for certain events, including, but not limited to, the issuance of certain stock dividends on our common stock, the issuance of certain rights or warrants, subdivisions, combinations, distributions of capital stock, indebtedness, or assets, cash dividends and certain issuer tender or exchange offers. However, the conversion rate will not be adjusted for other events, such as a third-party tender or exchange offer or an issuance of common stock for cash, that may adversely affect the trading price of the Notes or our common stock. An event that adversely affects the value of the Notes may occur, and that event may not result in an adjustment to the conversion rate.

Some significant restructuring transactions may not constitute a fundamental change, in which case we would not be obligated to offer to repurchase the Notes.

Upon the occurrence of a fundamental change, a holder of Notes has the right to require us to repurchase the Notes. However, the fundamental change provisions will not afford protection to holders of Notes in the event of other transactions that could adversely affect the Notes. For example, transactions such as leveraged recapitalizations, refinancings, restructurings, or acquisitions initiated by us may not constitute a fundamental change requiring us to repurchase the Notes. In the event of any such transaction, the holders would not have the right to require us to repurchase the Notes, even though each of these transactions could increase the amount of our indebtedness, or otherwise adversely affect our capital structure or any credit ratings, thereby adversely affecting the holders of Notes.

In addition, absent the occurrence of a fundamental change or a make-whole fundamental change as described under changes in the composition of our board of directors will not provide holders with the right to require us to repurchase the Notes or to an increase in the conversion rate upon conversion.

We cannot assure noteholders that an active trading market will develop or be maintained for the Notes.

We do not intend to apply to list our outstanding Notes on any securities exchange or to arrange for quotation on any automated dealer quotation system. In addition, the liquidity of the trading market in the Notes and the market price quoted for the Notes may be adversely affected by changes in the overall market for this type of security and by changes in our financial performance or prospects or in the prospects for companies in our industry generally. As a result, we cannot assure noteholders that an active trading market will develop or be maintained for the Notes. If an active trading market does not develop or is not maintained, the market price and liquidity of the Notes may be adversely affected. In that case, noteholders may not be able to sell the Notes at a particular time or at a favorable price.

Any adverse rating of the Notes may cause their trading price to fall.

We do not intend to seek a rating on the Notes. However, if a rating service were to rate the Notes and if such rating service were to lower its rating on the Notes below the rating initially assigned to the Notes or otherwise announces its intention to put the Notes on credit watch, the trading price of the Notes could decline.

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Holders of Notes may be subject to tax if we make or fail to make certain adjustments to the conversion rate of the Notes even though they do not receive a corresponding cash distribution.

The conversion rate of the Notes is subject to adjustment in certain circumstances, including the payment of cash dividends. If the conversion rate is adjusted as a result of a distribution that is taxable to our common stockholders, such as a cash dividend, a noteholder may be deemed to have received a dividend subject to U.S. federal income tax without the receipt of any cash. In addition, a failure to adjust (or to adjust adequately) the conversion rate after an event that increases a noteholder's proportionate interest in us could be treated as a deemed taxable dividend to you. If (i) a make-whole fundamental change occurs prior to February 6, 2021 (in the case of the 2014 Notes) or (ii) prior to February 6, 2023 (in the case of the 2018 Notes) or (x) upon our issuance of a notice of provisional redemption (in the case of the 2014 Notes) or (y) upon voluntary conversion of the 2018 Exchange Notes prior to the issuance of a notice of provisional redemption (in the case of the 2018 Notes), under some circumstances, we will increase the conversion rate for Notes converted in connection with the make-whole fundamental change or provisional redemption. Such increase may also be treated as a distribution subject to U.S. federal income tax as a dividend. For a non-U.S. holder, any deemed dividend would be subject to U.S. federal withholding tax at a 30% rate, or such lower rate as may be specified by an applicable treaty, which may be set off against subsequent payments on the Notes.

Any conversions of the Notes will dilute the ownership interest of our existing stockholders, including holders who had previously converted their notes.

Any conversion of some or all of the notes will dilute the ownership interests of our existing stockholders. The initial conversion price under the 2018 Notes is approximately $7.8775 as compared to approximately $55.94 under the 2014 Notes. As a result, each of the outstanding 2018 Notes is initially convertible into 126.9438 shares of our common stock per $1,000 principal amount while our outstanding 2014 Notes are initially convertible into 17.8750 shares of our common stock per $1,000 principal amount. Issuances of shares of common stock upon conversion of our Notes could depress the market price of our common stock and impair our ability to raise capital through the sale of additional equity securities. In addition, the existence of the Notes may encourage short selling by market participants because the conversion of the Notes could depress the price of our common stock.

Item 5. Other Information

None.

Item 6. Exhibits

The documents listed in the Exhibit List, which follows below, are incorporated by reference or are filed with this Quarterly Report on Form 10-Q, in each case as indicated therein (numbered in accordance with Item 601 of Regulation S-K).

EXHIBIT LIST

Exhibit Number	Description	Incorporated by Reference From Form	Incorporated by Reference From Exhibit Number	Date Filed
10.1	Loan and Security Agreement, dated and effective as of August 2, 2018, between Silicon Valley Bank and Fluidigm Corporation.	8-K	10.1	8/2/2018
10.2	Form of Retention Bonus Exchange Letter.	8-K	10.1	9/20/2018
31.1	Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 of Chief Executive Officer	Filed herewith		
31.2	Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 of Chief Financial Officer	Filed herewith		
32.1(1)	Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 of Chief Executive Officer	Furnished herewith		
32.2(1)	Certification Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 of Chief Financial Officer	Furnished herewith		
101.INS	XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.	Filed herewith		
101.SCH	XBRL Taxonomy Extension Schema Document	Filed herewith		
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document	Filed herewith		
101.LAB	XBRL Taxonomy Extension Label Linkbase Document	Filed herewith		
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document	Filed herewith		
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	Filed herewith		

(1) In accordance with Item 601(b)(32)(ii) of Regulation S-K and SEC Release No. 33-8238 and 34-47986, Final Rule: Management's Reports on Internal Control Over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports, the certifications furnished in Exhibits 32.1 and 32.2 hereto are deemed to accompany this Form 10-Q and will not be deemed "filed" for purposes of Section 18 of the Exchange Act. Such certifications will not be deemed to be incorporated by reference into any filings under the Securities Act or the Exchange Act, except to the extent that the registrant specifically incorporates it by reference.

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.

FLUIDIGM CORPORATION

Dated: November 6, 2018

By: /s/ Stephen Christopher Linthwaite
Stephen Christopher Linthwaite
President and Chief Executive Officer

Dated: November 6, 2018

By: /s/ Vikram Jog
Vikram Jog
Chief Financial Officer