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

Form 10-Q

(Mark One)

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

For the quarterly period ended March 31, 2019

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 001-34899

Pacific Biosciences of California, Inc.

(Exact name of registrant as specified in its charter)

Delaware **(State or other jurisdiction of incorporation or organization)**	**16-1590339** **(I.R.S. Employer Identification No.)**
1305 O'Brien Drive **Menlo Park, CA** **(Address of principal executive offices)**	**94025** **(Zip Code)**

(650) 521-8000
(Registrant's telephone number, including area code)

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

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☒
Non-accelerated filer	☐	Smaller reporting company	☐
Emerging growth company	☐		

Securities registered pursuant to section 12(b) of the Act

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.001 per share	PACB	The NASDAQ Stock Market LLC

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

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

Number of shares outstanding of the issuer's common stock as of April 30, 2019: 152,674,751

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PART I. FINANCIAL INFORMATION

Item 1. Financial Statements

PACIFIC BIOSCIENCES OF CALIFORNIA, INC.

Condensed Consolidated Balance Sheets
(Unaudited)

(in thousands, except per share amounts)	March 31, 2019	December 31, 2018
Assets		
Current assets		
Cash and cash equivalents	$ 38,205	$ 18,844
Investments	44,667	83,510
Accounts receivable	7,279	8,595
Inventory	19,650	17,878
Prepaid expenses and other current assets	2,787	2,832
Total current assets	112,588	131,659
Property and equipment, net	33,613	34,073
Operating lease right-of-use assets, net	34,811	—
Long-term restricted cash	4,500	4,500
Other long-term assets	65	43
Total assets	$ 185,577	$ 170,275
Liabilities and Stockholders' Equity		
Current liabilities		
Accounts payable	$ 8,740	$ 6,736
Accrued expenses	11,158	12,823
Deferred service revenue, current	6,428	6,537
Operating lease liabilities, current	3,521	—
Notes payable, current	14,938	—
Other liabilities, current	312	788
Total current liabilities	45,097	26,884
Deferred service revenue, non-current	769	890
Operating lease liabilities, non-current	44,861	—
Deferred rent, non-current	—	13,765
Notes payable, non-current	—	14,659
Financing derivative	—	16
Total liabilities	90,727	56,214
Commitments and contingencies		
Stockholders' equity		
Preferred stock, $0.001 par value:		
Authorized 50,000 shares; No shares issued or outstanding	—	—
Common stock, $0.001 par value:		
Authorized 1,000,000 shares; issued and outstanding 152,672 and 150,244 shares at March 31, 2019 and December 31, 2018, respectively	153	150
Additional paid-in capital	1,107,121	1,096,053
Accumulated other comprehensive income (loss)	6	(36)
Accumulated deficit	(1,012,430)	(982,106)
Total stockholders' equity	94,850	114,061
Total liabilities and stockholders' equity	$ 185,577	$ 170,275

See accompanying notes to the condensed consolidated financial statements.

PACIFIC BIOSCIENCES OF CALIFORNIA, INC.

Condensed Consolidated Statements of Operations and Comprehensive Loss
(Unaudited)

(in thousands, except per share amounts)	Three Months Ended March 31, 2019	2018
Revenue:		
Product revenue	$ 13,457	$ 16,282
Service and other revenue	2,968	3,080
Total revenue	16,425	19,362
Cost of revenue:		
Cost of product revenue	8,618	9,019
Cost of service and other revenue	2,690	3,047
Total cost of revenue	11,308	12,066
Gross profit	5,117	7,296
Operating expense:		
Research and development	15,485	16,311
Sales, general and administrative	19,766	14,934
Total operating expense	35,251	31,245
Operating loss	(30,134)	(23,949)
Interest expense	(625)	(581)
Other income, net	435	351
Net loss	(30,324)	(24,179)
Other comprehensive income (loss):		
Unrealized income (loss) on investments	42	(6)
Comprehensive loss	$ (30,282)	$ (24,185)
Net loss per share:		
Basic and diluted net loss per share	$ (0.20)	$ (0.20)
Shares used in computing basic and diluted net loss per share	151,274	123,768

See accompanying notes to the condensed consolidated financial statements.

PACIFIC BIOSCIENCES OF CALIFORNIA, INC.
Condensed Consolidated Statements of Stockholders' Equity
(Unaudited)

(in thousands)	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2018	150,244	$ 150	$ 1,096,053	$ (36)	$ (982,106)	$ 114,061
Net loss	—	—	—	—	(30,324)	(30,324)
Other comprehensive income	—	—	—	42	—	42
Issuance of common stock in conjunction with equity plans	2,428	3	6,687	—	—	6,690
Stock-based compensation expense	—	—	4,381	—	—	4,381
Balance at March 31, 2019	152,672	$ 153	$ 1,107,121	$ 6	$ (1,012,430)	$ 94,850
Balance at December 31, 2017	116,277	$ 116	$ 965,752	$ (32)	$ (879,733)	$ 86,103
Net loss	—	—	—	—	(24,179)	(24,179)
Other comprehensive loss	—	—	—	(6)	—	(6)
ASC 606 adoption effect					189	189
Issuance of common stock in conjunction with equity plans	1,220	2	2,485	—	—	2,487
Issuance of common stock from ATM equity offering, net of issuance costs	14,375	14	32,848	—	—	32,862
Stock-based compensation expense	—	—	5,282	—	—	5,282
Balance at March 31, 2018	131,872	$ 132	$ 1,006,367	$ (38)	$ (903,723)	$ 102,738

See accompanying notes to the consolidated financial statements.

PACIFIC BIOSCIENCES OF CALIFORNIA, INC.

Condensed Consolidated Statements of Cash Flows
(Unaudited)

(in thousands)	Three Months Ended March 31, 2019	2018
Cash flows from operating activities		
Net loss	$ (30,324)	$ (24,179)
Adjustments to reconcile net loss to net cash used in operating activities		
Depreciation	1,796	1,802
Amortization of operating lease right-of-use assets	653	—
Amortization of debt discount and financing costs	279	237
Gain on derivative	(16)	(171)
Stock-based compensation	4,381	5,282
Amortization (accretion) from investment premium (discount)	(416)	(38)
Changes in assets and liabilities		
Accounts receivable	1,316	4,981
Inventory	(1,888)	(2,720)
Prepaid expenses and other assets	87	312
Accounts payable	2,075	(942)
Accrued expenses	(1,703)	(2,402)
Deferred service revenue	(230)	(307)
Other liabilities	(1,323)	(628)
Net cash used in operating activities	(25,313)	(18,773)
Cash flows from investing activities		
Purchase of property and equipment	(1,253)	(344)
Purchase of investments	(17,623)	(31,547)
Sales of investments	—	2,442
Maturities of investments	56,860	21,700
Net cash provided by (used in) investing activities	37,984	(7,749)
Cash flows from financing activities		
Proceeds from issuance of common stock from equity plans	6,690	2,487
Proceeds from issuance of common stock from underwritten public equity offering, net of issuance costs	—	32,986
Net cash provided by financing activities	6,690	35,473
Net increase in cash and cash equivalents and restricted cash	19,361	8,951
Cash and cash equivalents and restricted cash at beginning of period	23,344	21,007
Cash and cash equivalents and restricted cash at end of period	$ 42,705	$ 29,958
Cash and cash equivalents at end of period	38,205	25,458
Restricted cash at end of period	4,500	4,500
Cash and cash equivalents and restricted cash at end of period	$ 42,705	$ 29,958

See accompanying notes to the condensed consolidated financial statements.

PACIFIC BIOSCIENCES OF CALIFORNIA, INC.

Notes to Condensed Consolidated Financial Statements
(Unaudited)

NOTE 1. OVERVIEW

We design, develop and manufacture sequencing systems to help scientists resolve genetically complex problems. Based on our novel Single Molecule, Real-Time (SMRT®) sequencing technology, our products enable: de novo genome assembly to finish genomes in order to more fully identify, annotate and decipher genomic structures; full-length transcript analysis to improve annotations in reference genomes, characterize alternatively spliced isoforms in important gene families, and find novel genes; targeted sequencing to more comprehensively characterize genetic variations; and real-time kinetic information for epigenome characterization. Our technology provides high accuracy, ultra-long reads, uniform coverage and the ability to simultaneously detect epigenetic changes. PacBio® sequencing systems, including consumables and software, provide a simple and fast end-to-end workflow for SMRT sequencing.

On November 1, 2018, we entered into an Agreement and Plan of Merger with Illumina, Inc. (“Illumina”) and FC Ops Corp., a wholly-owned subsidiary of Illumina (the “Merger Agreement”) pursuant to which Illumina will acquire us for $8.00 per share of our common stock in an all-cash transaction and FC Ops Corp. will be merged with and into us (the “Merger”), with us surviving the Merger and becoming a wholly-owned subsidiary of Illumina. Completion of the transaction is subject to terms and conditions set forth in the Merger Agreement, including expiration or termination of any waiting periods applicable to the consummation of the Merger under the United States Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended, and clearance under the antitrust laws of certain non-U. S. jurisdictions. At a Special Meeting of Stockholders held on January 24, 2019, our stockholders, among other things, approved the adoption of the Merger Agreement. The Merger has been notified to the United States Federal Trade Commission (“FTC”) and to the Competition and Markets Authority of the United Kingdom (“CMA”). We and Illumina continue to expect the Merger to be completed in mid-2019, at which time we will become a wholly-owned subsidiary of Illumina and will cease to be a publicly-traded company. No assurance can be given that the required regulatory approvals will be obtained or that the required conditions to closing will be satisfied, and, even if all such approvals are obtained and the conditions are satisfied, no assurance can be given as to the terms, conditions and timing of the approvals. Under certain circumstances specified in the Merger Agreement, Illumina may be required to pay us a termination fee of $98.0 million (the “Reverse Termination Fee”). For more information about the effects of our agreement to be acquired by Illumina please see Risk Factors under the section “Risks Related to Our Business”.

The names “Pacific Biosciences,” “PacBio,” “SMRT,” “SMRTbell,” “Sequel” and our logo are our trademarks.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation and Consolidation

In the opinion of management, our accompanying unaudited Condensed Consolidated Financial Statements (“Financial Statements”) have been prepared on a consistent basis with our December 31, 2018 audited Consolidated Financial Statements and include all adjustments, consisting of only normal recurring adjustments, necessary to fairly state the information set forth herein. The Financial Statements have been prepared in accordance with the rules and regulations of the Securities and Exchange Commission (“SEC”) and, as permitted by such rules and regulations, omit certain information and footnote disclosures necessary to present the statements in accordance with accounting principles generally accepted in the United States (“U.S. GAAP”). These Financial Statements should be read in conjunction with the audited consolidated financial statements and notes thereto included in our Annual Report on Form 10-K for the year ended December 31, 2018. The results of operations for the three months ended March 31, 2019 are not necessarily indicative of the results to be expected for the entire year or any future periods.

The consolidated financial statements include the accounts of Pacific Biosciences and our wholly-owned subsidiaries. All intercompany transactions and balances have been eliminated.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires us to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes to the financial statements. Our estimates include, but are not limited to, the valuation of inventory, the determination of stand-alone selling prices for revenue recognition, the valuation of a financing derivative and long-term notes, the valuation and recognition of share-based compensation, the expected renewal period for service contracts, the useful lives assigned to long-lived assets, the computation of provisions for income taxes and the determination of the internal borrow rate used in calculating the operating lease right-of-use assets and operating lease liabilities. Actual results could differ materially from these estimates.

Fair Value of Financial Instruments

The carrying amount of our accounts receivable, prepaid expenses, other current assets, accounts payable, accrued expenses and other liabilities, current, approximate fair value due to their short maturities.

The fair value hierarchy established under U.S. GAAP requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The three levels of inputs that may be used to measure fair value are as follows:

- Level 1: quoted prices in active markets for identical assets or liabilities;
- Level 2: inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices in active markets for similar assets or liabilities, quoted prices for identical or similar assets or liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities; and
- Level 3: unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

We consider an active market as one in which transactions for the asset or liability occurs with sufficient frequency and volume to provide pricing information on an ongoing basis. Conversely, we view an inactive market as one in which there are few transactions for the asset or liability, the prices are not current, or price quotations vary substantially either over time or among market makers. Where appropriate, our non-performance risk, or that of our counterparty, is considered in determining the fair values of liabilities and assets, respectively.

We classify our cash deposits and money market funds within Level 1 of the fair value hierarchy because they are valued using bank balances or quoted market prices. We classify our investments as Level 2 instruments based on market pricing and other observable inputs. We did not classify any of our investments within Level 3 of the fair value hierarchy.

Assets and liabilities measured at fair value are classified in their entirety based on the lowest level input that is significant to the fair value measurement. Our assessment of the significance of a particular input to the entire fair value measurement requires management to make judgments and consider factors specific to the asset or liability.

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following table sets forth the fair value of our financial assets and liabilities that were measured on a recurring basis as of March 31, 2019 and December 31, 2018 respectively (in thousands):

	March 31, 2019				December 31, 2018			
(in thousands)	**Level 1**	**Level 2**	**Level 3**	**Total**	**Level 1**	**Level 2**	**Level 3**	**Total**
Assets								
Cash and cash equivalents:								
Cash and money market funds	$ 29,329	$ —	$ —	$ 29,329	$ 18,844	$ —	$ —	$ 18,844
Commercial paper	—	8,876	—	8,876	—	—	—	—
Total cash and cash equivalents	29,329	8,876	—	38,205	18,844	—	—	18,844
Investments:								
Commercial paper	—	31,306	—	31,306	—	53,469	—	53,469
Corporate debt securities	—	6,979	—	6,979	—	10,214	—	10,214
US government & agency securities	—	6,382	—	6,382	—	19,827	—	19,827
Total investments	—	44,667	—	44,667	—	83,510	—	83,510
Long-term restricted cash:								
Cash	4,500	—	—	4,500	4,500	—	—	4,500
Total assets measured at fair value	$ 33,829	$ 53,543	$ —	$ 87,372	$ 23,344	$ 83,510	$ —	$ 106,854
Liabilities								
Financing derivative	$ —	$ —	$ —	$ —	$ —	$ —	$ 16	$ 16
Total liabilities measured at fair value	$ —	$ —	$ —	$ —	$ —	$ —	$ 16	$ 16

The estimated fair value of the Financing Derivative liability was determined using Level 3 inputs, or significant unobservable inputs.

During the three months ended March 31, 2019, there were no transfers between Level 1, Level 2, or Level 3 assets or liabilities reported at fair value on a recurring basis and our valuation techniques did not change compared to the prior year.

Financial Assets and Liabilities Not Measured at Fair Value on a Recurring Basis

We determined the fair value of the Notes from the debt facility that we entered into during the first quarter of 2013 using Level 3 inputs, or significant unobservable inputs. The value of the Notes was determined by comparing the difference between the fair value of the Notes with and without the Financing Derivative by calculating the respective present values from future cash flows using 8.4% and 9.6% weighted average market yield at March 31, 2019 and December 31, 2018, respectively. Refer to *Note 5. Notes Payable* for additional details regarding the Notes. The estimated fair value and carrying value of the Notes are as follows (in thousands):

The estimated fair value and carrying value of the Notes are as follows (in thousands):

	March 31, 2019		December 31, 2018	
	Fair Value	Carrying Value	Fair Value	Carrying Value
Notes payable	$ 16,083	$ 14,938	$ 15,915	$ 14,659

Net Loss per Share

The following outstanding common stock options, restricted stock units, or "RSUs", with time-based vesting and RSUs with performance-based vesting were excluded from the computation of diluted net loss per share for the periods presented because including them would have had an anti-dilutive effect. See *Note 7. Stockholders' Equity* for detailed information on RSUs with time-based vesting and RSUs with performance-based vesting.

	Three Months Ended March 31,	
(in thousands)	2019	2018
Options to purchase common stock	23,833	28,879
RSUs with time-based vesting	1,102	355
RSUs with performance-based vesting	138	652

Concentration and Other Risks

For the three months ended March 31, 2019 and 2018, one of our customers, Gene Company Limited, accounted for approximately 17% and 29% of our total revenue, respectively. Gene Company Limited is our distributor in China.

Going Concern

Cash, cash equivalents and investments, excluding restricted cash, at March 31, 2019 totaled $82.9 million, compared to $102.4 million at December 31, 2018. We believe that our existing cash, cash equivalents and investments, together with the Reverse Termination Fee or other remedies we may receive if the Merger Agreement is terminated under certain circumstances, will be sufficient to fund our projected operating requirements for at least twelve months from the date of filing of this Quarterly Report on Form 10-Q.

If the Merger Agreement is terminated and we are unable to obtain sufficient funds pursuant to the Merger Agreement, we may need to raise additional capital. To the extent we raise additional funds through the sale of equity or convertible debt, the issuance of such securities will result in dilution to our stockholders. There can be no assurance that such funds will be available on favorable terms, or at all, particularly in light of restrictions under our debt agreement and the Merger Agreement. If adequate funds are not available, we may be required to obtain funds by entering into collaboration, licensing or debt agreements on unfavorable terms. If we are unable to raise funds on favorable terms, or at all, we may have to reduce our cash burn rate and may not be able to support our commercialization efforts, or to increase or maintain the level of our research and development activities. If we are unable to generate sufficient cash flows or to raise adequate funds to finance our forecasted expenditures, we may have to make significant changes to our operations, including delaying or reducing the scope of or eliminating some or all of our development programs. We also may have to reduce sales, marketing, engineering, customer support or other resources devoted to our existing or new products or cease operations. If our cash, cash equivalents and investments are insufficient to fund our projected operating requirements, and

we are unable to raise capital, it would have a material adverse effect on our business, financial condition and results of operations.

Significant Accounting Policies

Except as noted below relating to our adoption of lease related accounting, there have been no material changes to our significant accounting policies as discussed in our Annual Report on Form 10-K for the year ended December 31, 2018.

Recent Accounting Pronouncements

Recently Issued Accounting Standards

ASU 2016-13

In June 2016, the Financial Accounting Standards Board, or FASB, issued ASU 2016-13, *Financial Instruments - Credit Losses: Measurement of Credit Losses on Financial Instruments*, or ASU 2016-13, which changes the impairment model for most financial assets. The new model uses a forward-looking expected loss method, which will generally result in earlier recognition of allowances for losses. ASU 2016-13 is effective for annual and interim periods beginning after December 15, 2019 and early adoption is permitted for annual and interim periods beginning after December 15, 2018. We plan to adopt ASU 2016-13 on January 1, 2020. However, we are still in the process of assessing the impact of the new standard on our results of operations or financial position.

Recently Adopted Accounting Standards

Adoption of ASU 2018-07

In June 2018, the FASB issued Accounting Standards Update, or ASU, 2018-07, *Improvements to Nonemployee Share-Based Payment Accounting*, to simplify the accounting for nonemployee share-based payment transactions by expanding the scope of Accounting Standards Codification, or ASC, Topic 718, Compensation - Stock Compensation, to include share-based payment transactions for acquiring goods and services from nonemployees. Under the new standard, most of the guidance on stock compensation payments to nonemployees would be aligned with the requirements for share-based payments granted to employees. This standard is effective for annual reporting periods beginning after December 15, 2018, including interim reporting periods within those annual reporting periods, with early adoption permitted. We adopted this standard beginning in January 1, 2019 and the adoption of this standard did not have a material impact on our condensed consolidated financial statements for the three months ended March 31, 2019.

Adoption of ASU 2018-02

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*, that allows for an entity to elect to reclassify the income tax effects on items within accumulated other comprehensive income resulting from U.S. tax reform to retained earnings. The guidance is effective for fiscal years beginning after December 15, 2018 with early adoption permitted, including interim periods within those years. We adopted this standard beginning in January 1, 2019 and the adoption of this standard did not have a material impact on our condensed consolidated financial statements for the three months ended March 31, 2019.

Adoption of ASC 842

On January 1, 2019, we adopted the FASB Accounting Standards Codification, or ASC, Topic 842, *Leases*, or ASC 842, which requires the recognition of the right-of-use assets and related operating and finance lease liabilities on the condensed consolidated balance sheet. As permitted by ASC 842, we elected the adoption date of January 1, 2019, which is the date of initial application. As a result, the condensed consolidated balance sheet prior to January 1, 2019 was not restated, continues to be reported under ASC Topic 840, *Leases*, or ASC 840, which did not require the recognition of operating lease liabilities on the condensed consolidated balance sheet, and is not comparative. The expense recognition for operating leases under ASC 842 is substantially consistent with ASC 840. As a result, there is no significant difference in our results of operations presented in our condensed consolidated statements of operations and comprehensive loss for each period presented.

We adopted ASC 842 using a modified retrospective approach for leases existing at January 1, 2019. The adoption of ASC 842 had a substantial impact on our balance sheet. The most significant impact was the recognition of the operating lease right-of-use assets and the liability for operating leases. Accordingly, adoption of this standard resulted in the recognition of operating lease right-of-use assets of $35.5 million and operating lease liabilities of $49.2 million comprised of $3.4 million of current operating lease liabilities and $45.8 million of non-current operating lease liabilities on the condensed consolidated balance sheet as of January 1, 2019.

As permitted under ASC 842, we elected several practical expedients that permit us:

- to not reassess whether a contract is or contains a lease;
- to not reassess the lease classification;
- to not reassess the initial direct costs as of the adoption date;
- to not recognize right-of-use assets and lease liabilities for short-term leases that have a term of 12 months or less; and
- to not separate non-lease components for real estate leases.

The application of the practical expedients did not have a significant impact on the measurement of the operating lease liabilities.

Service and other revenue can include some revenue from instrument lease agreements. Instrument leases are generally classified as operating-type leases and revenue from these leases is recognized on a straight-line basis over the respective lease term. Lease income was not material in fiscal 2018 or the first quarter of 2019.

Disclosure related to the amount, timing and uncertainty of cash flows arising from operating leases are included in “Leases” section of *Note 6. Commitments and Contingencies.*

NOTE 3. CASH, CASH EQUIVALENTS AND INVESTMENTS

The following tables summarize our cash, cash equivalents and investments as of March 31, 2019 and December 31, 2018 (in thousands):

	As of March 31, 2019			
	Amortized Cost	Gross unrealized gains	Gross unrealized losses	Fair Value
Cash and cash equivalents:				
Cash and money market funds	$ 29,329	$ —	$ —	$ 29,329
Commercial paper	8,877	—	(1)	8,876
Total cash and cash equivalents	38,206	—	(1)	38,205
Investments:				
Commercial paper	31,309	1	(4)	31,306
Corporate debt securities	6,970	10	(1)	6,979
US government & agency securities	6,381	1	—	6,382
Total investments	44,660	12	(5)	44,667
Total cash, cash equivalents and investments	$ 82,866	$ 12	$ (6)	$ 82,872
Long-term restricted cash:				
Cash	$ 4,500	$ —	$ —	$ 4,500

	As of December 31, 2018			
	Amortized Cost	Gross unrealized gains	Gross unrealized losses	Fair Value
Cash and cash equivalents:				
Cash and money market funds	$ 18,844	$ —	$ —	$ 18,844
Commercial paper	—	—	—	—
Total cash and cash equivalents	18,844	—	—	18,844
Investments:				
Commercial paper	53,493	—	(24)	53,469
Corporate debt securities	10,223	3	(12)	10,214
US government & agency securities	19,830	—	(3)	19,827
Total investments	83,546	3	(39)	83,510
Total cash, cash equivalents and investments	$ 102,390	$ 3	$ (39)	$ 102,354
Long-term restricted cash:				
Cash	$ 4,500	$ —	$ —	$ 4,500

The following table summarizes the contractual maturities of our cash equivalents and available-for-sale investments, excluding money market funds, as of March 31, 2019:

(in thousands)	Fair Value
Due in one year or less	$ 53,543
Total investments	$ 53,543

Actual maturities may differ from contractual maturities because issuers may have the right to call or prepay obligations without call or prepayment penalties.

NOTE 4. BALANCE SHEET COMPONENTS

Inventory

As of March 31, 2019 and December 31, 2018, our inventory consisted of the following components:

(in thousands)	March 31, 2019	December 31, 2018
Purchased materials	$ 6,253	$ 6,222
Work in process	9,104	7,341
Finished goods	4,293	4,315
Inventory	$ 19,650	$ 17,878

NOTE 5. NOTES PAYABLE

Facility Agreement

Under the terms of our February 2013 debt agreement with Deerfield (the “Facility Agreement”), we received $20.5 million and issued promissory notes in the aggregate principal amount of $20.5 million (the “Notes”). The Notes bear simple interest at a rate of 8.75% per annum, payable quarterly in arrears commencing on April 1, 2013 and on the first business day of each January, April, July and October thereafter. The Facility Agreement has a maximum term of seven years. We received net proceeds of $20.0 million, representing $20.5 million of gross proceeds, less a $500,000 facility fee, before deducting other expenses of the transaction. On June 23, 2017, pursuant to a partial exercise by the Notes holders of their right to elect to receive up to 25% of the net proceeds from any financing that includes an equity component, we paid $4.5 million of outstanding principal, together with accrued and unpaid interest, to one of the Note holders with proceeds from our underwritten public equity offering. As of March 31, 2019, a balance of $16.0 million aggregate principal amount of debt remained outstanding under this facility and due in February 2020, and we reclassified the notes payable from “Notes payable, non-current” to “Notes payable, current”.

The Facility Agreement also contains various representations and warranties, and affirmative and negative covenants, customary for financings of this type, including restrictions on our ability to incur additional indebtedness or liens on our assets, except as permitted under the Facility Agreement. In addition, the Facility Agreement requires us to maintain consolidated cash and cash equivalents on the last day of each calendar quarter of not less than $2.0 million. As security for our repayment of our obligations under the Facility Agreement, we granted the lenders a security interest in substantially all of our property and interests in property.

Subject to certain exceptions set forth in the Facility Agreement, holders representing a majority of the aggregate principal amount of the outstanding Notes issued pursuant to the Facility Agreement may elect to receive up to 25% of the net proceeds from any financing that includes an equity component. To the extent we raise additional capital in the future through the sale of common stock, including without limitation, sales of common stock pursuant to an “at-the-market” offering program, we may be obligated, at the election of the holders of the Notes, to pay 25% of the net proceeds from any such financing activities as partial payment of the Notes.

Financing Derivative

A number of features embedded in the Notes required accounting for as a derivative, including the indemnification of certain withholding taxes and the acceleration of debt upon (i) a qualified financing, (ii) an event of default, (iii) a major transaction, and (iv) the exercise of the warrant via offset to debt principal. These features represent a single derivative (the "Financing Derivative") that was bifurcated from the debt instrument and accounted for as a liability at fair value, with changes in fair value between reporting periods recorded in other income (expense), net.

The estimated fair value of the Financing Derivative was determined by comparing the difference between the fair value of the Notes with and without the Financing Derivative by calculating the respective present values from future cash flows using a 8.4% and 9.6% weighted average market yield at March 31, 2019 and December 31, 2018, respectively. The estimated fair value of the Financing Derivative as of March 31, 2019 and December 31, 2018 was $0 and $16,000, respectively.

As of March 31, 2019, payments due under our notes payable, which include interest and principal, were as follows:

	Amount
	(in thousands)
Remainder of 2019	$ 1,047
2020	16,491
Total remaining payments	17,538
Less: interest and discounts	(2,600)
Notes payable	$ 14,938

NOTE 6. COMMITMENTS AND CONTINGENCIES

Leases

As of January 1, 2019, we lease approximately 180,000 square feet in 1305 O'Brien Drive, Menlo Park, California, where we house our headquarters, research and development, service and support functions, and our in-house manufacturing operations for which the right of use assets totaled $35.3 million. We also lease a sales office facility in Singapore and engineering support facilities in Allen, Texas for which the right of use assets totaled $0.2 million as of January 1, 2019.

All our leases are operating leases. Operating lease assets and liabilities are reflected within "Operating lease right-of-use assets, net", "Operating lease liabilities, current" and "Operating lease liabilities, non-current" on the condensed consolidated balance sheets. These assets and liabilities are recognized at the commencement date based on the present value of remaining minimum lease payments over the lease term using our estimated secured incremental borrowing rates at the effective date of January 1, 2019. Lease payments included in the measurement of the lease liability comprise the base rent per the term of the Lease. Lease expense for these leases is recognized on a straight-line basis over the lease term, with variable lease payments, such as common area maintenance fees, recognized in the period those payments are incurred.

We often have options to renew lease terms for buildings. For our 1305 O'Brien lease, the renewal option is 5 years and the rent will be based on fair market value at the time of renewal and was not included in the lease term. In addition, certain lease arrangements may be terminated prior to their original expiration date at our discretion. We evaluate renewal and termination options at the lease commencement date to determine if we are reasonably certain to exercise the option on the basis of economic factors. The weighted average remaining lease term for our operating leases as of March 31, 2019 was 8.6 years.

The discount rate implicit within our leases is generally not determinable and therefore we determine the discount rate based on our incremental borrowing rate. The incremental borrowing rate for our leases is determined based on lease term and currency in which lease payments are made, adjusted for impacts of collateral. The weighted average discount rate used to measure our operating lease liabilities as of March 31, 2019 was 7.9%.

The following table presents information at the amount, timing and uncertainty of cash flows arising from our operating leases as of March 31, 2019:

Maturity of Lease Liabilities	**Amount**
Years ending December 31,	**(in thousands)**
Remaining of 2019	$ 5,262
2020	7,136
2021	7,305
2022	7,488
2023	7,704
Thereafter	31,518
Total undiscounted operating lease payments	66,413
Less: imputed interest	(18,031)
Present value of operating lease liabilities	48,382
Balance Sheet Classification	
Operating lease liabilities, current	3,521
Operating lease liabilities, non-current	44,861
Total operating lease liabilities	48,382

Cash Flows

An initial right-of-use asset of $35.5 million was recognized as a non-cash asset addition on the condensed consolidated balance sheet as of January 1, 2019 with the adoption of the new lease accounting standard. Cash paid for amounts included in the present value of operating lease liabilities was $1.8 million during the first quarter of 2019 and included in operating cash flow.

Operating Lease Costs

Operating lease costs were $1.6 million during the first quarter of 2019, primarily related to our operating leases, but also include immaterial amounts for variable leases.

For our 1305 O'Brien lease, we were required to establish a letter of credit for the benefits of the landlord and to submit $4.5 million as a deposit for the letter of credit in October 2015; and, as such, $4.5 million was recorded at such time and continued to be recorded in "Long-term restricted cash" in the condensed consolidated balance sheet as of both March 31, 2019 and December 31, 2018. Pursuant to the terms of the 1305 O'Brien lease, the $4.5 million in restricted cash was reduced to $4.0 million as of May 1, 2019 and will reduce again over time.

Contingencies

We may become involved in legal proceedings, claims and assessments from time to time in the ordinary course of business. We accrue liabilities for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated.

Legal

Legal Proceedings Regarding the Merger

In connection with the proposed acquisition of us by Illumina, five lawsuits were filed, with each lawsuit naming us and our directors as defendants. Three putative class action complaints, captioned Wang v. Pacific Biosciences of California, Inc., et al., No. 3:18-cv-7450 (N.D. Cal.), Morrison v. Pacific Biosciences of California, Inc., et al., No. 3:18-cv-7654 (N.D. Cal.), and Speiser v. Pacific Biosciences of California, Inc., et al., No. 3:19-cv-0072 (N.D. Cal.), were filed in the United States District Court for the Northern District of California on December 11, 2018, December 20, 2018, and January 4, 2019, respectively. A fourth putative class action complaint, captioned Rosenblatt v. Pacific Biosciences of California, Inc., et al., No. 1:18-cv-2005 (D. Del.), was filed in the United States District Court for the District of Delaware on December 18, 2018. An individual complaint, captioned Washington v. Pacific Biosciences of California, Inc., et al., No. 5:18-cv-7614 (N.D. Cal.), was filed in the United States District Court for the Northern District of California on December

19, 2018. Each of these lawsuits asserted claims under Section 14(a) and Section 20(a) of the Securities Exchange Act of 1934 in connection with the disclosures contained in our preliminary proxy statement on Schedule 14A, filed with the Securities Exchange Commission (the "SEC") on December 5, 2018, our definitive proxy statement on Schedule 14A, filed with the SEC on December 18, 2018, or both. The complaints sought a variety of equitable and injunctive relief including, among other things, enjoining the consummation of the acquisition and awarding the plaintiffs costs and attorneys' fees.

Although our management believed that the claims were without merit, we agreed to make supplemental disclosures in exchange for plaintiffs' agreement that the supplemental disclosures would moot their claims. We made these supplemental disclosures in a proxy statement amendment on Schedule 14A, filed with the SEC on January 18, 2019.

On January 29, 2019, all parties to each of the lawsuits reached an agreement pursuant to which we would pay a total of $300,000 in attorneys' fees to the plaintiffs. On January 29, 2019, each plaintiff filed a voluntary dismissal of his or her lawsuit. As of March 31, 2019, we accrued a total amount of $300,000 for the five lawsuits filed in 2018 and the first quarter of 2019.

USITC Proceedings

On November 2, 2016, we filed a complaint against Oxford Nanopore Technologies Ltd. ("ONT Ltd."), Oxford Nanopore Technologies, Inc. ("ONT Inc.") and Metrichor, Ltd. ("Metrichor" and, together with ONT Ltd. and ONT Inc., "ONT") with the U.S. International Trade Commission ("USITC") for patent infringement. On December 5, 2016, the USITC provided notice that an investigation had been instituted based on the complaint. We sought exclusionary relief with respect to several ONT products, including ONT's MinION and PromethION devices. The complaint was based on our U.S. Patent No. 9,404,146, entitled "Compositions and methods for nucleic acid sequencing" which covers novel methods for sequencing single nucleic acid molecules using linked double-stranded nucleic acid templates, providing improved sequencing accuracy. On March 1, 2017, we filed an amended complaint to add a second patent in the same patent family, U.S. Patent No. 9,542,527, which was granted on January 10, 2017, to the investigation. We sought, among other things, an exclusion order permanently barring entry of infringing ONT products into the United States, and a cease and desist order preventing ONT from advertising and selling infringing products in the United States. On May 23, 2017, the Administrative Law Judge ("ALJ") assigned to the matter issued an order construing certain claim terms of the asserted patents. On June 8, 2017, ONT filed a summary determination motion to terminate the proceedings based on the ALJ's claim construction decision, and we did not oppose the motion. The ALJ granted the motion on July 19, 2017, and, on July 31, 2017, we filed a petition to review with the USITC to correct what we believe was an incorrect construction of the claims. On September 5, 2017, the USITC issued a notice granting our petition to review the ALJ's claim construction decision. On February 7, 2018, the USITC issued a notice indicating that it had determined to adopt the ALJ's claim construction and terminating the investigation. On February 13, 2018, we filed a petition to appeal the USITC's ruling to the U.S. Court of Appeals for the Federal Circuit. ("Federal Circuit"). An oral hearing for this appeal was held on February 8, 2019. On February 12, 2019, the Federal Circuit filed a judgement affirming the USITC claim construction under Federal Circuit Rule 36 without a written opinion.

U.S. District Court Proceedings

On March 15, 2017, we filed a complaint in the U.S. District Court for the District of Delaware against ONT Inc. for patent infringement (C.A. No. 17-cv-275 ("275 Action")). The complaint is based on our U.S. Patent No. 9,546,400 (the "'400 Patent"), entitled "Nanopore sequencing using n-mers" which covers novel methods for nanopore sequencing of nucleic acid molecules using the signals from multiple monomeric units. This patent was granted on January 17, 2017. We are seeking remedies including injunctive relief, damages and costs. On May 8, 2017, the defendants filed a motion to dismiss the complaint, alleging that the asserted patent claims recite patent ineligible subject matter. On November 9, 2017, the judge denied ONT Inc.'s motion to dismiss. On June 1, 2018, we filed a motion for leave to amend the complaint to add ONT Ltd. as a defendant. On August 20, 2018, the judge granted our motion, and on August 23, 2018, we filed an amended complaint, adding ONT Ltd. as a defendant in the 275 Action. On September 24, 2018, ONT Ltd. filed a motion to dismiss the amended complaint, alleging failure to state a claim. On April 29, 2019, the judge denied ONT Ltd.'s motion to dismiss.

On September 12, 2018, ONT Inc. filed its answer, defenses and counterclaims in the 275 Action, seeking declaratory judgements of non-infringement and invalidity of the '400 Patent and unenforceability of the '400 Patent based on alleged inequitable conduct before the U.S. Patent and Trademark Office ("USPTO"), as well as antitrust, false advertising, and unfair competition counterclaims. On September 25, 2018, it was stipulated that the motion to dismiss ONT Inc.'s counterclaims that we submitted in the 1353 Action would also serve as our motion to dismiss ONT Inc.'s counterclaims in the 275 Action. On February 19, 2019, the judge granted our motion to dismiss ONT Inc.'s antitrust, false advertising, and unfair competition counterclaims in each action.

Related to the 275 Action, on March 15, 2018, ONT Inc. filed a petition to institute an inter partes review with the Patent Trial and Appeal Board ("PTAB") of the USPTO, alleging invalidity of the '400 Patent. On July 5, 2018, we filed a preliminary response outlining for the PTAB why the petition should be denied and no review should be instituted. On

September 25, 2018, the PTAB denied ONT Inc.'s petition for institution of the inter partes review for all claims of the '400 Patent.

On September 25, 2017, we filed a second complaint in the U.S. District Court for the District of Delaware against ONT Inc. for patent infringement (C.A. No. 17-cv-1353 ("1353 Action")). The complaint is based on our U.S. Patent No. 9,678,056 (the "'056 Patent") entitled "Control of Enzyme Translation in Nanopore Sequencing", granted June 13, 2017, and U.S. Patent No. 9,738,929 (the "'929 Patent") entitled "Nucleic Acid Sequence Analysis", granted August 22, 2017. We are seeking remedies including injunctive relief, damages and costs. On December 14, 2017, the defendants filed a motion to dismiss the complaint, alleging that the asserted patent claims in the '929 Patent recite patent ineligible subject matter. On March 22, 2018, the judge denied ONT Inc.'s motion to dismiss. On March 28, 2018, we added a claim for infringement of our U.S. Patent No. 9,772,323 (the "'323 Patent"), entitled "Nanopore sequencing using n-mers." On June 1, 2018, we filed a motion for leave to amend the complaint to add ONT Ltd. as a defendant. On August 20, 2018, the judge granted our motion, and on August 23, 2018 we filed an amended complaint, adding ONT Ltd. as a defendant in the 1353 Action. On September 24, 2018, ONT filed a motion to dismiss the amended complaint, alleging failure to state a claim. On April 24, 2019, the judge denied ONT Ltd.'s motion to dismiss.

On April 25, 2018, ONT Inc. filed its answer, defenses and counterclaims in the 1353 Action, seeking declaratory judgements of non-infringement and invalidity of the '056 and '323 Patents and unenforceability of the '056 and '323 Patents based on alleged inequitable conduct before the USPTO, as well as antitrust, false advertising, and unfair competition counterclaims. On June 15, 2018, we filed a motion to dismiss ONT Inc.'s counterclaims in the 1353 Action and, on June 18, 2018, we filed a motion to bifurcate and stay discovery on ONT Inc.'s antitrust counterclaims in the 1353 Action. On February 19, 2019, the judge granted our motion to dismiss ONT Inc.'s antitrust, false advertising, and unfair competition counterclaims.

Related to the 1353 Action, on September 24, 2108, ONT Inc. filed a first petition to institute an inter partes review with the PTAB of the USPTO, alleging invalidity of the '929 Patent. On September 25, 2018, ONT Inc. filed a second petition to institute an inter partes review of the '929 Patent based on the same art and arguments as the first petition. ONT Inc. subsequently filed a motion to withdraw the first petition, which motion was granted. On January 11, 2019, we filed a preliminary response to the second petition outlining for the PTAB why the petition should be denied, and no review should be instituted. On March 26, 2019, the PTAB denied ONT Inc.'s petition for institution of the inter partes review for all claims of the '929 Patent.

Also related to the 1353 Action, on September 25, 2018, ONT Inc. filed a petition to institute an inter partes review with the PTAB of the USPTO, alleging invalidity of the '056 Patent. On February 13, 2019, we filed a preliminary response to the second petition outlining for the PTAB why the petition should be denied and no review should be instituted. On March 25, 2019, ONT Inc. moved to withdraw its petition for institution of the inter partes review of the '056 Patent, which motion was granted by the PTAB on March 26, 2019, thus terminating the proceedings.

A claim construction (or "Markman") hearing for the U.S. District Court matters was held on December 17, 2018. On March 6, 2019, a claim construction order construing various claim terms in the patents in suit was issued. A trial for the U.S. District Court matters is scheduled to occur in March 2020.

UK and German Court Proceedings

On February 2, 2017, we filed a claim in the High Court of England and Wales against ONT Ltd. and Metrichor for infringement of Patent EP(UK) 3 045 542 (the "'542 Patent"), which is in the same patent family as the patents asserted in the USITC action referred to above. We sought remedies including injunctive relief, damages, and costs. On March 27, 2017, the defendants in the case filed their defense and counterclaim, denying infringement and seeking a declaration that the asserted patent is invalid. We filed our reply and defense to counterclaim on April 12, 2017. A case management conference was held on June 13, 2017. On August 31, 2017 we added a claim for infringement of a newly granted divisional, EP(UK) 3 170 904 (the "'904 Patent"). On December 22, 2017, ONT Ltd. added to the action a request for declaration of non-infringement of its 1D2 product. On January 12, 2018 we served reply to ONT Ltd.'s request for a declaration of non-infringement, asserting infringement of both patents by ONT's 1D2 product. A trial for these matters was scheduled to occur in May 2018.

On April 21, 2017, ONT Ltd. and Harvard University filed a claim against us in the High Court of England and Wales for infringement of Patent EP(UK) 1 192 453 (the "'453 Patent"), a patent owned by Harvard University and entitled "Molecular and atomic scale evaluation of biopolymers," and for which ONT Ltd. alleges it holds an exclusive license. ONT Ltd. and Harvard University sought remedies including injunctive relief, damages, and costs. On April 25, 2017, ONT Ltd. announced that it also had filed a claim against us in the District Court of Mannheim, Germany, for infringement of the German version of the patent. On November 2, 2017, we filed our statement of defense in the German infringement matter and we also filed a separate nullity action in Germany to establish that the '453 Patent is invalid. On December 6, 2017, we filed a cross-complaint in the German infringement matter alleging ONT Ltd.'s infringement in Germany of our '542 Patent. The trial date for the German infringement matter and cross-complaint was set for July 27, 2018. A trial for the UK matter

was scheduled to occur in March 2019.

On May 8, 2018, the parties entered a settlement of all UK and German court proceedings pending as of such date. Under the terms of the settlement, ONT agreed not to make, dispose of, use or import any “2D” nanopore sequencing products, or to induce or assist others to carry out a “2D” sequencing process, in the UK or Germany, through the end of 2023. During this time, we agreed not to assert the ’542 Patent and ’904 Patent against either ONT or its customers in the UK or Germany. Accordingly, the High Court of England and Wales entered an order staying our UK action against ONT through the end of 2023. As part of the settlement, ONT and Harvard University dismissed their UK and German actions under the ’453 Patent and agreed not to assert the ’453 Patent against us or our customers through the end of 2023. We correspondingly agreed to dismiss our separate German nullity action seeking to invalidate the ’453 Patent, which expires on June 22, 2020.

Related to these proceedings, on August 15, 2017, ONT Ltd. filed a notice of opposition to our ’542 Patent with the European Patent Office, and on August 16, 2017, an anonymous party filed a second notice of opposition to the same patent, each alleging invalidity of the patent. On April 5, 2018, we filed our response to the combined opposition. On January 22, 2019, an oral hearing in the matter occurred and the European Patent Office rendered a decision in favor of the opponents. We believe the European Patent Office erred in its decision and we intend to appeal the decision. The ’542 Patent will remain in effect while the appeal is pending. Our settlement agreement with ONT Ltd. and Harvard University will also remain in effect regardless of the outcome of the appeal.

Also related to these proceedings, on May 16, 2018, ONT Ltd. filed a notice of opposition to our ’904 Patent with the European Patent Office alleging invalidity of the ’904 Patent. On October 11, 2018, we filed our response to the opposition. An oral hearing in the matter is scheduled for July 16, 2019.

Litigation is inherently unpredictable, and it is too early in the proceedings to predict the outcome of these lawsuits or any impact they may have on us. As such, the estimated financial effect associated with these complaints cannot be made as of the date of filing of this Annual Report on Form 10-K. Litigation is a significant ongoing expense with an uncertain outcome, and has been in the past and may in the future be a material expense for us. Management believes this investment is important to protect our intellectual property position, even recognizing the uncertainty of the outcome.

Other Proceedings

From time to time, we may also be involved in a variety of other claims, lawsuits, investigations and proceedings relating to securities laws, product liability, patent infringement, contract disputes, employment and other matters that arise in the normal course of our business. In addition, third parties may, from time to time, assert claims against us in the form of letters and other communications. We record a provision for contingent losses when it is both probable that a liability has been incurred and the amount of the loss can be reasonably estimated. We currently do not believe that the ultimate outcome of any of the matters described above is probable or reasonably estimable, or that these matters will have a material adverse effect on our business; however, the results of litigation and claims are inherently unpredictable. Regardless of the outcome, litigation can have an adverse impact on us because of litigation and settlement costs, diversion of management resources and other factors.

Indemnification

Pursuant to Delaware law and agreements entered into with each of our directors and officers, we may have obligations, under certain circumstances, to hold harmless and indemnify each of our directors and officers against losses suffered or incurred by the indemnified party in connection with their service to us, and judgements, fines, settlements and expenses related to claims arising against such directors and officers to the fullest extent permitted under Delaware law, our bylaws and certificate of incorporation. We also enter and have entered into indemnification agreements with our directors and officers that may require us to indemnify them against liabilities that arise by reason of their status or service as directors or officers, except as prohibited by applicable law. In addition, we may have obligations to hold harmless and indemnify third parties involved with our fundraising efforts and their respective affiliates, directors, officers, employees, agents or other representatives against any and all losses, claims, damages and liabilities related to claims arising against such parties pursuant to the terms of agreements entered into between such third parties and us in connection with such fundraising efforts. To the extent that any such indemnification obligations apply to the lawsuits described above, any associated expenses incurred are included within the related accrued litigation expense amounts. No additional liability associated with such indemnification obligations has been recorded at March 31, 2019.

NOTE 7. STOCKHOLDERS’ EQUITY

Underwritten Public Equity Offering

In August 2017, we filed a shelf registration statement on Form S-3 with the SEC pursuant to which we may, from time to time, sell up to an aggregate of $150.0 million of our common stock, preferred stock, depository shares, warrants, units or debt securities. On August 18, 2017, the registration statement was declared effective by the SEC, which allows us to access the capital markets for the three-year period following this effective date.

In February 2018, we entered into an underwriting agreement, relating to the public offering of 12,500,000 shares of our common stock, $0.001 par value per share, at a price to the public of $2.40 per share. Under the terms of the underwriting agreement, we also granted the underwriters a 30-day option to purchase up to an additional 1,875,000 shares of our common stock, which was subsequently exercised in full, and the offering as well as the sale of shares of common stock subject to the underwriters' option, closed in February 2018. In total, we sold 14.4 million shares of our common stock at a price of $2.40 per share. We paid a commission equal to 4% of the gross proceeds from the sale of shares of our common stock under the underwriting agreement. The total net proceeds to us from the offering after deducting the underwriting discount were approximately $33.1 million, which excludes approximately $0.3 million of offering expenses.

In September 2018, we entered into an underwriting agreement, relating to the public offering of 14,117,647 shares of our common stock, $0.001 par value per share, at a price to the public of $4.25 per share. Under the terms of the underwriting agreement, we also granted the underwriters a 30-day option to purchase up to an additional 2,117,647 shares of our common stock, which was subsequently exercised in full, and the offering as well as the sale of shares of common stock subject to the underwriters' option, closed in September 2018. In total, we sold 16.2 million shares of our common stock at a price of $4.25 per share. We paid a commission equal to 6% of the gross proceeds from the sale of shares of our common stock under the underwriting agreement. The total net proceeds to us from the offering after deducting the underwriting discount were approximately $64.9 million, excluding approximately $0.2 million of offering expenses.

In total, for the year ended December 31, 2018, we issued 30.6 million shares of our common stock through our two underwritten public offerings with a weighted average offering price of $3.38 per share. The total net proceeds to us from the two offerings, after deducting the underwriting commissions and offering expenses, were approximately $97.5 million.

Subject to certain exceptions set forth in our Facility Agreement, holders of our Notes may elect to receive up to 25% of the net proceeds from financing activities that include an equity component as prepayment of the Notes to be applied first, to accrued and unpaid interest and second, to principal. However, in both February 2018 and September 2018, holders representing a majority of the aggregate principal amount of the outstanding Notes waived such right in connection with the issuance and sale of shares of common stock in our public offering.

Equity Plans

As of March 31, 2019, we had three active equity compensation plans: the 2010 Equity Incentive Plan ("2010 Plan"), the 2010 Outside Director Equity Incentive Plan ("2010 Director Plan"), and the 2010 Employee Stock Purchase Plan ("ESPP"). Under the 2010 Plan, with the approval of the Compensation Committee of the Board of Directors, we may grant restricted stock, RSU, stock appreciation rights and new shares of common stock upon exercise of stock options.

In January 2019, an additional 7.5 million shares were reserved under the 2010 Plan, and an additional 3.0 million shares were reserved under the ESPP pursuant to the evergreen provisions thereof.

Stock Options

The following table summarizes stock option activity for all our stock option plans for the three months ended March 31, 2019 (in thousands, except per share amounts):

		Stock Options Outstanding		
	Shares available for grant	Number of shares	Exercise price	Weighted average exercise price
Balances, December 31, 2018	12,279	25,176	$ 1.16 – 16.00	$ 5.66
Additional shares reserved	7,512			
Options granted	—	—	—	—
Options exercised	—	(801)	1.16 – 7.05	4.84
Options canceled	542	(542)	2.54 – 16.0	0 10.27
Balances, March 31, 2019	20,333	23,833	$ 1.16 – 16.00	$ 5.58

Restricted Stock Units, or "RSUs"

Time-based RSUs

Beginning in the three months ended March 31, 2018, the Compensation Committee of the Board of Directors has approved awards of RSUs with time-based vesting from the 2010 Plan to certain employees. Each RSU represents one equivalent share of our common stock to be awarded after the vesting period. These RSUs vest over four years at a rate of 25% annually. The fair value for these RSUs is based on the closing price of our common stock on the date of grant. We measure compensation expense for these RSUs at fair value on the date of grant and recognize the expense over the expected vesting period on a straight-line basis. The RSUs do not entitle participants to the rights of holders of common stock, such as voting rights, until the shares are issued. The number of RSUs vested includes shares of common stock that we will withhold on behalf of employees to satisfy the minimum statutory tax withholding requirements. RSUs that are expected to vest are net of estimated future forfeitures.

The following table summarizes the time-based RSUs activity for the three months ended March 31, 2019 (in thousands, except per share amounts):

	Number of shares	Weighted average grant date fair value
RSUs outstanding at December 31, 2018	371	$ 3.20
RSUs granted	815	7.18
RSUs released	(78)	2.58
RSUs forfeited	(6)	7.16
Unvested RSUs outstanding at March 31, 2019	1,102	$ 6.17

For the three months ended March 31, 2019 and 2018, we recognized compensation expense of $658,000 and $19,000, respectively, related to time-based RSUs.

Performance-based RSUs

During the three months ended March 31, 2018, the Compensation Committee of the Board of Directors approved awards of RSUs with performance-based vesting from the 2010 Plan to certain employees. Each RSU represents one equivalent share of our common stock to be awarded upon vesting at the end of the performance periods, if specific performance goals set by the Compensation Committee of the Board of Directors are achieved. No RSUs with performance-based vesting will vest if the performance goals are not met. The fair value of these RSUs is based on the closing price of our common stock on the date of grant. We make a quarterly probability assessment as to whether the performance goals will be achieved. Changes in our assessment of the probability of vesting results in adjustments to stock-based compensation, which may include either a cumulative catch-up of expense or a reduction of expense depending on whether the likelihood of vesting has increased or decreased, that is recognized in the period such determination is made. The RSUs

do not entitle participants to the rights of holders of common stock, such as voting rights, until the shares are issued. The number of RSUs vested includes shares of common stock that we will withhold on behalf of employees to satisfy the minimum statutory tax withholding requirements. RSUs that are expected to vest are net of estimated future forfeitures.

The following table summarizes the performance-based RSUs activity for the three months ended March 31, 2019 (in thousands, except per share amounts):

	Number of shares	Weighted average grant date fair value
PSUs outstanding at December 31, 2018	586	$ 2.58
PSUs granted	—	—
PSUs released	(204)	2.57
PSUs forfeited	(244)	2.57
Unvested PSUs outstanding at March 31, 2019	138	$ 2.63

For the three months ended March 31, 2019 and 2018, we recognized compensation expense of $7,000 and $90,000, respectively, related to performance-based RSUs.

ESPP shares

Shares issued under our ESPP totaled 1,306,329 and 1,113,790 shares during the three months ended March 31, 2019 and 2018, respectively. As of March 31, 2019, 3,651,066 shares of our common stock remain available for issuance under our ESPP.

Pursuant to the terms of the Merger Agreement, the ESPP was terminated after the completion of the purchase period ended March 1, 2019.

Stock-Based Compensation

The following table summarizes the stock-based compensation expense for stock options, RSUs and shares from the ESPP for the three months ended March 31, 2019 and 2018, respectively (in thousands):

	Three Months Ended March 31,	
	2019	2018
Cost of revenue	$ 512	$ 664
Research and development	2,012	2,222
Sales, general and administrative	1,857	2,396
Total stock-based compensation expense	$ 4,381	$ 5,282

We estimated the fair value of employee stock options on the grant date using the Black-Scholes option pricing model. The estimated fair value of employee stock options is amortized on a straight-line basis over the requisite service period of the awards. We did not grant any stock options during the three months ended March 31, 2019.

	Three Months Ended March 31,	
Stock Option	2019	2018
Expected term in years	—	5.2
Expected volatility	—	67%
Risk-free interest rate	—	2.5%
Dividend yield	—	—

We estimate the value of employee stock purchase rights on the grant date using the Black-Scholes option pricing

model. Pursuant to the terms of the Merger Agreement, the ESPP was terminated after the completion of the purchase period ended March 1, 2019. As such there will be no more offerings after March 1, 2019 and there were no new Black-Scholes calculations performed to calculate the fair value of new purchase rights granted for the three months ended March 31, 2019.

	Three Months Ended March 31,	
ESPP	**2019**	**2018**
Expected term in years	—	0.5-2.0
Expected volatility	—	67%
Risk-free interest rate	—	1.9%-2.2%
Dividend yield	—	—

NOTE 8. REVENUE

As of March 31, 2019, we had a total of $7.2 million of deferred service revenue from our service contracts, $6.4 million of which was recorded as “Deferred service revenue, current” to be recognized over the next year and the remaining $0.8 million was recorded as “Deferred service revenue, non-current” to be recognized in the next 2 to 3 years. Revenue recorded in the three months ended March 31, 2019 includes $2.4 million of previously deferred revenue that was included in “Deferred service revenue, current” as of December 31, 2018. Contract assets as of March 31, 2019 and December 31, 2018 were not material.

As of March 31, 2019, we had a total of $0.3 million of deferred commissions included in “Prepaid expenses and other current assets” which is recognized as the related revenue is recognized. Additionally, as a practical expedient, we expense costs to obtain a contract as incurred if the amortization period would have been a year or less.

A summary of our revenue by geographic location for the three months ended March 31, 2019 and 2018 is as follows:

	Three Months Ended March 31,	
	2019	**2018**
North America	$ 8,988	$ 7,811
Europe (including the Middle East and Africa)	3,064	4,013
Asia Pacific	4,373	7,538
Total	$ 16,425	$ 19,362

A summary of our revenue by category for the three months ended March 31, 2019 and 2018 is as follows (in thousands):

	Three Months Ended March 31,	
(in thousands)	**2019**	**2018**
Instrument revenue	$ 5,623	$ 7,144
Consumable revenue	7,834	9,138
Product revenue	13,457	16,282
Service and other revenue	2,968	3,080
Total revenue	$ 16,425	$ 19,362

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

You should read the following discussion and analysis of our financial condition and results of operations together with our condensed consolidated financial statements and the related notes included in this Quarterly Report on Form 10-Q and those in our Annual Report on Form 10-K for the year ended December 31, 2018. Some of the information contained in this discussion and analysis or set forth elsewhere in this report, including information with respect to our products, plans and strategy for our business and related financing, includes forward-looking statements that involve risks and uncertainties, including statements regarding our expected financial results in future periods and the consummation and timing of the proposed acquisition of us by Illumina, Inc. ("Illumina"). The words "anticipates," "believes," "could," "estimates," "expects," "intends," "may," "might," "plans," "potential," "predicts," "projects," "seeks," "should," "target," "will," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. You should read the "Risk Factors" section of this Quarterly Report on Form 10-Q for a discussion of important factors that could cause actual results to differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis. We do not assume any obligation to update any forward-looking statements.

Merger with Illumina, Inc.

On November 1, 2018, we entered into an Agreement and Plan of Merger with Illumina, Inc. ("Illumina") and FC Ops Corp., a wholly-owned subsidiary of Illumina (the "Merger Agreement") pursuant to which Illumina will acquire us for $8.00 per share of our common stock in an all-cash transaction and FC Ops Corp. will be merged with and into us (the "Merger"), with us surviving the Merger and becoming a wholly-owned subsidiary of Illumina. Completion of the transaction is subject to terms and conditions set forth in the Merger Agreement, including expiration or termination of any waiting periods applicable to the consummation of the Merger under the United States Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended, and clearance under the antitrust laws of certain non-U. S. jurisdictions. At a Special Meeting of Stockholders held on January 24, 2019, our stockholders, among other things, approved the adoption of the Merger Agreement. The Merger has been notified to the United States Federal Trade Commission ("FTC") and to the Competition and Markets Authority of the United Kingdom ("CMA"). We and Illumina continue to expect the Merger to be completed in mid-2019, at which time we will become a wholly-owned subsidiary of Illumina and will cease to be a publicly-traded company. No assurance can be given that the required regulatory approvals will be obtained or that the required conditions to closing will be satisfied, and, even if all such approvals are obtained and the conditions are satisfied, no assurance can be given as to the terms, conditions and timing of the approvals. Under certain circumstances specified in the Merger Agreement, Illumina may be required to pay us a termination fee of $98.0 million (the "Reverse Termination Fee"). For more information about the effects of our agreement to be acquired by Illumina please see Risk Factors under the section "Risks Related to Our Business".

Overview

We design, develop and manufacture sequencing systems to help scientists resolve genetically complex problems. Based on our novel Single Molecule, Real-Time (SMRT®) sequencing technology, our products enable: de novo genome assembly to finish genomes in order to more fully identify, annotate and decipher genomic structures; full-length transcript analysis to improve annotations in reference genomes, characterize alternatively spliced isoforms in important gene families, and find novel genes; targeted sequencing to more comprehensively characterize genetic variations; and real-time kinetic information for epigenome characterization. Our technology provides high accuracy, ultra-long reads, uniform coverage and the ability to simultaneously detect epigenetic changes. PacBio® sequencing systems, including consumables and software, provide a simple and fast end-to-end workflow for SMRT sequencing.

Our current products include the Sequel instrument and the Sequel SMRT Cell 1M, which together are capable of sequencing up to approximately one million DNA molecules simultaneously. We are continuously developing new products including the SMRT Cell 8M, which is designed to have up to eight times as much throughput capability as the Sequel SMRT Cell 1M. We commenced our Early Access Program for the SMRT Cell 8M chip and platform, the Sequel II System, in January 2019 and the five early access sites selected have since purchased their initial Sequel II Systems. We announced the commercial launch of the Sequel II System and SMRT Cell 8M on April 24, 2019.

Basis of Presentation

Revenue

During the three months ended March 31, 2019 and 2018, product revenue was primarily derived from the sale of (1) Sequel instruments, and (2) consumables associated with Sequel and RSII instruments. Service and other revenue was primarily derived from product maintenance agreements sold on our installed instruments.

Cost of Revenue

Cost of revenue reflects the direct cost of product components, third-party manufacturing services and our internal manufacturing overhead and customer service infrastructure costs incurred to produce, deliver, maintain and support our instruments, consumables, and services. There are no incremental costs associated with our contractual revenue; all product development costs are reflected in research and development expense.

Manufacturing overhead is predominantly comprised of labor and facility costs. We determine and capitalize manufacturing overhead into inventory based on a standard cost model that approximates actual costs.

Service costs include the direct costs of components used in support, repair and maintenance of customer instruments as well as the cost of personnel, materials, shipping and support infrastructure necessary to support our installed customer base.

Research and Development Expense

Research and development expenses consist primarily of expenses for personnel engaged in the development of our SMRT Sequencing technology, the design and development of our future products and current product enhancements. These expenses also include prototype-related expenditures, development equipment and supplies, facilities costs and other related overhead. We expense research and development costs during the period in which the costs are incurred. However, we defer and capitalize non-refundable advance payments made for research and development activities until the related goods are received or the related services are rendered.

Sales, General and Administrative Expense

Sales, general and administrative expenses include costs for sales, marketing and administrative personnel, sales and marketing activities, tradeshow expenses, legal expenses, regulatory fees and general corporate expenses.

Interest Expense

Interest expense is primarily related to our debt facility and includes the amortization of debt discount and other related costs.

Other Income (Expense), Net

Other income (expense), net consists primarily of interest income earned on cash and investments, accretion of discounts and amortization of premiums related to investments, net gains or losses on foreign currency transactions, net gains or losses resulting from changes in the estimated fair value of the financing derivative.

Income Taxes

Except for the three months ended September 30, 2015, we have incurred net losses in every quarter since inception and have not recorded any U.S. federal or state income tax benefits for such losses as they have been fully offset by valuation allowances.

Critical Accounting Policies and Estimates

The discussion and analysis of our financial condition and results of operations are based upon our unaudited Financial Statements, which have been prepared in accordance with the rules and regulations of the SEC. The preparation of these Financial Statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses. On an ongoing basis, we evaluate our critical accounting policies and estimates. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

We adopted ASC 2016-02, *Leases (Topic 842)*, (“the new leases standard” or “ASC 842”) on January 1, 2019, using the modified retrospective method. Please see “Recently Adopted Accounting Standards” in the *Note 2 Summary of Significant Accounting Policies* and the *Leases* section of *Note 6 Commitments and contingencies* of Item 1. Financial Statements.

Except as noted above, there have been no other material changes to our significant accounting policies as discussed in our Annual Report on Form 10-K for the year ended December 31, 2018.

Results of Operations

Comparison of the three months ended March 31, 2019 and 2018

(in thousands, except percentages)	Three Months Ended March 31, 2019	2018	$ Change	% Change
	(unaudited)			
Revenue:				
Product revenue	$ 13,457	$ 16,282	$ (2,825)	(17%)
Service and other revenue	2,968	3,080	(112)	(4%)
Total revenue	16,425	19,362	(2,937)	(15%)
Cost of Revenue:				
Cost of product revenue	8,618	9,019	(401)	(4%)
Cost of service and other revenue	2,690	3,047	(357)	(12%)
Total cost of revenue	11,308	12,066	(758)	(6%)
Gross profit	5,117	7,296	(2,179)	(30%)
Operating Expense:				
Research and development	15,485	16,311	(826)	(5%)
Sales, general and administrative	19,766	14,934	4,832	32%
Total operating expense	35,251	31,245	4,006	13%
Operating loss	(30,134)	(23,949)	(6,185)	(26%)
Interest expense	(625)	(581)	(44)	(8%)
Other income, net	435	351	84	24%
Net loss	$ (30,324)	$ (24,179)	$ (6,145)	(25%)

Revenue

Total revenue for the three months ended March 31, 2019 was $16.4 million, compared to $19.4 million for the same period during 2018.

Product revenue of $13.4 million for the three months ended March 31, 2019 consisted of $5.6 million from sales of Sequel and Sequel II instruments and $7.8 million from sales of consumables, compared to total product revenue of $16.3 million for the same period during 2018, consisting of $7.2 million from sales of Sequel instruments and $9.1 million from sales of consumables. The decrease in instrument sales was primarily attributable to a lower number of instrument shipments and installations. The decrease in consumable sales was primarily attributable to a decrease in RSII consumables.

Service and other revenue of $3.0 million and $3.1 million for the three months ended March 31, 2019 and 2018, respectively, was primarily derived from product maintenance agreements sold on our installed instruments. Service revenue was relatively flat as increases in Sequel service revenue were offset by decrease in RSII service revenue.

Gross Profit

Gross profit for the three months ended March 31, 2019 was $5.1 million, resulting in a gross margin of 31.2%, compared to gross profit of $7.3 million, resulting in a gross margin of 37.7% for the same period during 2018. Gross profit for the three months ended March 31, 2019 was negatively impacted by approximately $1.0 million of product transition costs including an inventory reserve taken relating to an updated forecast of a faster transition from Sequel to Sequel II instrument sales.

Research and Development Expense

During the three months ended March 31, 2019, research and development expense decreased by $0.8 million, or 5.1%, compared to the same period during 2018. The decrease in research and development expense was primarily driven by lower chip development costs. Research and development expense included stock-based compensation expense of $2.0 million and $2.2 million during the three months ended March 31, 2019 and 2018, respectively.

Sales, General and Administrative Expense

During the three months ended March 31, 2019, sales, general and administrative expense increased by $4.8 million, or 32.4%, compared to the same period during 2018. The increase in sales, general and administrative expense was primarily attributable to acquisition-related legal fees of $5.7 million, partially offset by lower legal fees incurred in connection with patent litigation. Sales, general and administrative expense included stock-based compensation expense of $1.9 million and $2.4 million during the three months ended March 31, 2019 and 2018, respectively.

Interest Expense

Interest expense for the three months ended March 31, 2019 remained flat compared to the same period during 2018. Interest expense related primarily to the debt facility entered into in February 2013. As of March 31, 2019, a balance of $16.0 million aggregate principal amount of debt remained outstanding under this facility and is due in February 2020. For the period ended March 31, 2019, we reclassified the notes payable under this facility from “Notes payable, non-current” to “Notes payable, current”.

Liquidity and Capital Resources

Liquidity

Cash, cash equivalents and investments, excluding restricted cash, at March 31, 2019 totaled $82.9 million, compared to $102.4 million at December 31, 2018. We believe that our existing cash, cash equivalents and investments, together with the Reverse Termination Fee or other remedies we may receive if the Merger Agreement is terminated under certain circumstances, will be sufficient to fund our projected operating requirements for at least twelve months from the date of filing of this Quarterly Report on Form 10-Q; however, if the Merger Agreement is terminated and we are unable to obtain sufficient funds, we may raise additional capital in the future. Our view regarding sufficiency of cash and liquidity is primarily based on our financial forecast for 2019, which includes various assumptions regarding demand for our products. Generally, we expect demand for our products to increase.

Factors that may affect our capital needs include, but are not limited to, slower than expected adoption of our products resulting in lower sales of our products and services; our ability to obtain new collaboration and customer arrangements; the progress of our research and development programs; initiation or expansion of research programs and collaborations; the purchase of patent licenses; future acquisitions; manufacturing costs; service costs; the impact of product quality; litigation costs, including the costs involved in preparing, filing, prosecuting, defending and enforcing intellectual property rights; costs of developing new and enhanced products; and other factors.

To the extent we raise additional funds through the sale of equity or convertible debt securities, the issuance of such securities will result in dilution to our stockholders. There can be no assurance that such funds will be available on favorable terms, or at all, particularly in light of restrictions under our debt agreement. If adequate funds are not available, we may be required to obtain funds by entering into collaboration, licensing or debt agreements on unfavorable terms. If we are unable to raise funds on favorable terms, or at all, we may have to reduce our cash burn rate and may not be able to support our commercialization efforts, or to increase or maintain the level of our research and development activities. If we are unable to generate sufficient cash flows or to raise adequate funds to finance our forecasted expenditures, we may have to make significant changes to our operations, including delaying or reducing the scope of or eliminating some or all of our development programs. We also may have to reduce sales, marketing, engineering, customer support or other resources devoted to our existing or new products or cease operations. If our cash, cash equivalents and investments are insufficient to fund our projected operating requirements, and we are unable to raise capital, it would have a material adverse effect on our business, financial condition and results of operations.

Operating Activities

Our primary uses of cash in operating activities are for the development of ongoing product enhancements and future products, manufacturing, and support functions related to our sales, general and administrative activities. The net cash used for the three months ended March 31, 2019 and 2018 primarily reflected the net loss for those periods, partially offset by non-cash operating expenses including depreciation and stock-based compensation, as well as changes in working capital.

We used $25.3 million of cash from operating activities for the three months ended March 31, 2019, compared to cash usage of $18.8 million for the same period in 2018.

Cash used in operating activities for the three-month period ended March 31, 2019 was due primarily to a net loss of $30.3 million, offset by non-cash items such as stock-based compensation of $4.4 million and depreciation of $1.8 million.

The change in net operating assets and liabilities was primarily attributed to an increase of $2.1 million in accounts payable, partially offset by an increase of $1.9 million in inventory.

Cash used in operating activities for the three-month period ended March 31, 2018 was due primarily to a net loss of $24.2 million, offset by non-cash items such as stock-based compensation of $5.3 million and depreciation of $1.8 million. The change in net operating assets and liabilities was primarily attributed to a decrease of $5.0 million in accounts receivable, partially offset by an increase of $2.7 million in inventory and a decrease of $2.4 million in accrued expenses.

Investing Activities

Our investing activities consist primarily of capital expenditures and investment purchases, sales and maturities. We had $38.0 million of cash provided from investing activities for the three months ended March 31, 2019, compared to cash used of $7.7 million from investing activities for the same period in 2018.

Cash provided in investing activities for the three-month period ended March 31, 2019 was due primarily to net maturities of investments of $39.2 million.

Cash used in investing activities for the three-month period ended March 31, 2018 was due primarily to net purchase of investments of $7.4 million.

Financing Activities

We had $6.7 million of cash provided from financing activities for the three months ended March 31, 2019, compared to $35.5 million of cash provided from financing activities for the same period in 2018.

Cash provided by financing activities during the three-month period ended March 31, 2019 was due to $6.7 million from the issuance of common stock through our equity compensation plans.

Cash provided by financing activities during the three-month period ended March 31, 2018 was due primarily to net proceeds of $33.0 million from our underwritten public equity follow-on offering, after deducting underwriter commissions and paid offering expenses, and $2.5 million from the issuance of common stock through our equity compensation plans.

Capital Resources

In August 2017, we filed a shelf registration statement on Form S-3 with the SEC pursuant to which we may, from time to time, sell up to an aggregate of $150.0 million of our common stock, preferred stock, depository shares, warrants, units or debt securities. On August 18, 2017, the registration statement was declared effective by the SEC, which allows us to access the capital markets for the three-year period following this effective date.

Underwritten Public Equity Offering

In August 2017, we filed a shelf registration statement on Form S-3 with the SEC pursuant to which we may, from time to time, sell up to an aggregate of $150.0 million of our common stock, preferred stock, depository shares, warrants, units or debt securities. On August 18, 2017, the registration statement was declared effective by the SEC, which allows us to access the capital markets for the three-year period following this effective date.

In February 2018, we entered into an underwriting agreement, relating to the public offering of 12,500,000 shares of our common stock, $0.001 par value per share, at a price to the public of $2.40 per share. Under the terms of the underwriting agreement, we also granted the underwriters a 30-day option to purchase up to an additional 1,875,000 shares of our common stock, which was subsequently exercised in full, and the offering as well as the sale of shares of common stock subject to the underwriters' option, closed in February 2018. In total, we sold 14.4 million shares of our common stock at a price of $2.40 per share. We paid a commission equal to 4% of the gross proceeds from the sale of shares of our common stock under the underwriting agreement. The total net proceeds to us from the offering after deducting the underwriting discount were approximately $33.1 million, which excludes approximately $0.3 million of offering expenses.

In September 2018, we entered into an underwriting agreement, relating to the public offering of 14,117,647 shares of our common stock, $0.001 par value per share, at a price to the public of $4.25 per share. Under the terms of the underwriting agreement, we also granted the underwriters a 30-day option to purchase up to an additional 2,117,647 shares of our common stock, which was subsequently exercised in full, and the offering as well as the sale of shares of common stock subject to the underwriters' option, closed in September 2018. In total, we sold 16.2 million shares of our common stock at a price of $4.25 per share. We paid a commission equal to 6% of the gross proceeds from the sale of shares of our common stock under the underwriting agreement. The total net proceeds to us from the offering after deducting the underwriting discount were approximately $64.9 million, excluding approximately $0.2 million of offering expenses.

In total, for the year ended December 31, 2018, we issued 30.6 million shares of our common stock through our two underwritten public offerings with a weighted average offering price of $3.38 per share. The total net proceeds to us from the two offerings, after deducting the underwriting commissions and offering expenses, were approximately $97.5 million.

Subject to certain exceptions set forth in our Facility Agreement, holders of our Notes may elect to receive up to 25% of the net proceeds from financing activities that include an equity component as prepayment of the Notes to be applied first, to accrued and unpaid interest and second, to principal. However, in both February 2018 and September 2018, holders representing a majority of the aggregate principal amount of the outstanding Notes waived such right in connection with the issuance and sale of shares of common stock in our public offering.

Debt Facility Agreement

Under the terms of our February 2013 debt agreement with Deerfield (the "Facility Agreement"), we received $20.5 million and issued promissory notes in the aggregate principal amount of $20.5 million (the "Notes"). The Notes bear simple interest at a rate of 8.75% per annum, payable quarterly in arrears commencing on April 1, 2013 and on the first business day of each January, April, July and October thereafter. The Facility Agreement has a maximum term of seven years. We received net proceeds of $20.0 million, representing $20.5 million of gross proceeds, less a $500,000 facility fee, before deducting other expenses of the transaction. On June 23, 2017, pursuant to a partial exercise by the Notes holders of their right to elect to receive up to 25% of the net proceeds from any financing that includes an equity component, we paid $4.5 million of outstanding principal, together with accrued and unpaid interest, to one of the Notes holders with proceeds from our underwritten public equity offering. As of March 31, 2019, a balance of $16.0 million aggregate principal amount of debt remained outstanding under this facility and is due in February 2020. For the period ended March 31, 2019, we reclassified the notes payable under this facility from "Notes payable, non-current" to "Notes payable, current".

The Facility Agreement also contains various representations and warranties, and affirmative and negative covenants, customary for financings of this type, including restrictions on our ability to incur additional indebtedness or liens on our assets, except as permitted under the Facility Agreement. In addition, the Facility Agreement requires us to maintain consolidated cash and cash equivalents on the last day of each calendar quarter of not less than $2.0 million. As security for our repayment of our obligations under the Facility Agreement, we granted the lenders a security interest in substantially all of our property and interests in property.

Subject to certain exceptions set forth in the Facility Agreement, holders representing a majority of the aggregate principal amount of the outstanding Notes issued pursuant to the Facility Agreement may elect to receive up to 25% of the net proceeds from any financing that includes an equity component. To the extent we raise additional capital in the future through the sale of common stock, including without limitation, sales of common stock pursuant to an "at-the-market" offering program, we may be obligated, at the election of the holders of the Notes, to pay 25% of the net proceeds from any such financing activities as partial payment of the Notes.

Off-Balance Sheet Arrangements

As of March 31, 2019, we did not have any off-balance sheet arrangements.

In the ordinary course of business, we enter into standard indemnification arrangements. Pursuant to these arrangements, we indemnify, hold harmless, and agree to reimburse the indemnified parties for losses suffered or incurred by the indemnified party in connection with any trade secret, copyright, patent or other intellectual property infringement claim by any third party with respect to its technology, or from claims relating to our performance or non-performance under a contract, any defective products supplied by us, or any acts or omissions, or willful misconduct, committed by us or any of our employees, agents or representatives. The term of these indemnification agreements is generally perpetual after the execution of the agreement. The maximum potential amount of future payments we could be required to make under these agreements is not determinable because it involves claims that may be made against us in future periods, but have not yet been made. To date, we have not incurred costs to defend lawsuits or settle claims related to these indemnification agreements.

We also enter and have entered into indemnification agreements with our directors and officers that may require us to indemnify them against liabilities that arise by reason of their status or service as directors or officers, except as prohibited by applicable law. In addition, we may have obligations to hold harmless and indemnify third parties involved with our fundraising efforts and their respective affiliates, directors, officers, employees, agents or other representatives against any and all losses, claims, damages and liabilities related to claims arising against such parties pursuant to the terms of agreements entered into between us and such third parties in connection with such fundraising efforts. To the extent that such indemnification obligations apply to the lawsuits described in "Note 6. Commitments and Contingencies" in Part I, Item 1 of this Form 10-Q, any associated expenses incurred are included within the related accrued litigation expense amounts. No additional liability associated with such indemnification agreements has been recorded as of March 31, 2019.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

Interest Rate and Market Risk

Our exposure to market risk is confined to our cash, cash equivalents and investments, all of which have maturities of less than three years. The goals of our investment policy are preservation of capital, fulfillment of liquidity needs and fiduciary control of cash, cash equivalents and investments. We also seek to maximize income from our investments without assuming significant risk. To achieve our goals, we maintain a portfolio of cash equivalents and investments in a variety of securities of high credit quality. The securities in our investment portfolio are not leveraged, are classified as available for sale, and are, due to their short-term nature, subject to minimal interest rate risk. We currently do not hedge interest rate exposure. Because of the short-term maturities of our investments, we do not believe that a hypothetical 10% change in market interest rates would have any material negative impact on the value of our investment portfolio.

Foreign Exchange Risk

The majority of our expense and capital purchasing activities are transacted in U.S. dollars. However, a portion of our operations consists of sales activities outside of the United States; therefore, we have foreign exchange exposures relating to non-U.S. dollar revenues, operating expenses, accounts receivable, accounts payable, and currency balances. Our primary exposure is with the Euro. Actual gains and losses in the future may differ materially from the hypothetical gains and losses based on changes in the timing and amount of foreign currency exchange rate movements and our actual exposure; however, we do not believe that the effect of a hypothetical 10% change in foreign currency exchange rates applicable to our business would have a material impact on our historical consolidated financial statements.

Our international operations are subject to risks typical of international operations, including, but not limited to, differing economic conditions, changes in political climate, differing tax structures, other regulations and restrictions and foreign exchange rate volatility.

Item 4. Controls and Procedures

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 defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act) as of the end of the period covered by this Quarterly Report on Form 10-Q. Based on this evaluation, our chief executive officer and our chief financial officer concluded that our disclosure controls and procedures are designed at a reasonable assurance level and are effective to provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and that such information is accumulated and communicated to our management, including our chief executive officer and our chief financial officer, as appropriate, to allow timely decisions regarding required disclosure.

In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints and that management is required to apply its judgment in evaluating the benefits of possible controls and procedures relative to their costs.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the quarter ended March 31, 2019 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II – OTHER INFORMATION

Item 1. Legal Proceedings

Please see *Note 6. Commitments and Contingencies* of Item 1. of Financial Statements under Part I – Financial Information.

Item 1A. Risk Factors

You should consider carefully the risks and uncertainties described below, together with all of the other information in our public filings with the Securities and Exchange Commission, which could materially affect our business, financial condition, results of operations and prospects. The risks described below are not the only risks facing us. Risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially affect our business, financial condition, results of operations and prospects.

Risks Related to Our Business

The announcement and pendency of our agreement to be acquired by Illumina could adversely affect our business.

On November 1, 2018, we entered into a definitive agreement to be acquired by Illumina. Uncertainty about the effect of the proposed acquisition on our customers, employees, partners and other parties may adversely affect our business. Our employees may experience uncertainty about their roles or seniority following the closing of the acquisition. There can be no assurance that our employees, including key personnel, will be retained, or that, prior to the closing of the proposed acquisition, we will be able to attract and retain employees to the same extent that we have previously been able to. Any loss or distraction of such employees could adversely affect our business and operations. In addition, we have diverted, and will continue to divert, significant management resources toward the completion of the acquisition, which could adversely affect our business and operations. Parties with which we do business may experience uncertainty associated with the acquisition, including with respect to current or future business relationships with us. Uncertainty may cause customers to refrain from doing business with us, which could adversely affect our business, results of operations and financial condition.

The parties must obtain certain regulatory approvals in order to complete the transactions contemplated by the Merger Agreement; if such approvals are not obtained or are obtained with conditions, the acquisition may be prevented or delayed or the anticipated benefits of the acquisition may be reduced.

Consummation of the acquisition by Illumina is conditioned upon, among other things, the absence of any law or order prohibiting or restraining the acquisition or any law making the consummation of the acquisition illegal and the expiration or termination of the waiting period (and any extensions thereof) applicable to the acquisition under the U.S. Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended ("HSR Act"). The proposed acquisition has been notified to the FTC.

In the EU, the proposed acquisition is not reviewable under Council Regulation (EC) No. 139/2004. The transaction is a relevant merger situation which has been notified to the CMA under the Enterprise Act 2002, as amended by the Enterprise and Regulatory Reform Act 2013. At any time before or after the acquisition is consummated, any of the U.S. Department of Justice, the FTC, U.S. state attorneys general, or the CMA could take action under the antitrust laws in opposition to the acquisition, including seeking to enjoin completion of the acquisition, condition completion of the acquisition upon the divestiture of assets of Illumina, us or their and our respective subsidiaries, or impose restrictions on Illumina's post-acquisition operations. Any such requirements or restrictions may prevent or delay completion of the acquisition or may reduce the anticipated benefits of the acquisition. No assurance can be given that the required regulatory approvals will be obtained or that the required conditions to closing will be satisfied, and, even if all such approvals are obtained and the conditions are satisfied, no assurance can be given as to the terms, conditions and timing of the approvals. For more information about the effects of a failure to complete the acquisition, see the risk factor below entitled "The failure to complete the acquisition by Illumina could adversely affect our business".

The failure to complete the acquisition by Illumina could adversely affect our business.

Consummation of our acquisition by Illumina is subject to several conditions beyond our control that may prevent, delay, or otherwise adversely affect its completion. If any of these conditions are not satisfied or waived, it is possible that the acquisition will not be consummated in the expected time frame (or at all) or that the Merger Agreement may be terminated. If the proposed acquisition is not completed, the share price of our common stock may decrease to the extent that the current market price of our common stock reflects an assumption that the proposed acquisition will be completed. In addition, under circumstances specified in the Merger Agreement, we may be required to pay a termination fee of $43 million to Illumina. Furthermore, under certain circumstances specified in the Merger Agreement, Illumina may be required to pay us the Reverse Termination Fee. However, the Reverse Termination Fee will not be available in all instances in which the Merger Agreement is terminated, and no assurance can be given that it will be received by us. In addition, the Reverse Termination Fee may not be sufficient to compensate us for damages suffered by our business as a result of the pendency of the Merger or of the strategic initiatives foregone by us during the period.

While the acquisition by Illumina is pending, we are subject to business uncertainties and contractual restrictions that could harm our operations and the future of our business or result in a loss of employees.

Pursuant to the terms of the Merger Agreement, we are subject to certain customary restrictions on the conduct of our business. These restrictions generally require us to conduct our businesses in the ordinary course, consistent with past practice, and subject us to a variety of specified limitations, including the ability in certain cases to enter into material contracts, acquire or dispose of assets, incur indebtedness or incur capital expenditures, until the proposed Merger becomes effective or the Merger Agreement terminates. These restrictions, which are standard for a transaction of this type, may inhibit our ability to take actions outside of the ordinary course of our business that are inconsistent with our past practice but which we may consider advantageous and limit our ability to respond to future business opportunities and industry developments that may arise during such period. The pendency of the acquisition may also divert management's attention and our resources from ongoing business and operations. Our customers, employees, partners and other parties may have uncertainties about the effects of the acquisition. In connection with the proposed acquisition, it is possible that some customers and other persons with whom we have a business relationship may delay or defer certain business decisions or might decide to seek to terminate, change or renegotiate their relationship with us as a result of the proposed acquisition. If any of these effects were to occur, it could materially and adversely impact our revenue, earnings, cash flows and other business results and our financial condition, as well as the market price of our common stock and our perceived acquisition value, regardless of whether the proposed acquisition is completed. In addition, whether or not the acquisition is completed, while it is pending we will continue to incur costs, fees, expenses and charges related to the acquisition, which may materially and adversely affect our financial condition.

The Merger Agreement limits our ability to pursue alternatives to the proposed acquisition.

The Merger Agreement contains provisions that make it more difficult for us to enter into alternative transactions. The Merger Agreement contains certain provisions that restrict our ability to, among other things, solicit, initiate or knowingly encourage or knowingly facilitate the submission of inquiries; or proposals that constitute or that would reasonably be expected to lead to any acquisition proposal from a third party. The Merger Agreement also provides that our board of directors will not change its recommendation that our stockholders adopt the Merger Agreement and will not approve any agreement with respect to an acquisition proposal from a third party.

Litigation may arise in connection with the proposed acquisition by Illumina, which could be costly and divert management's attention and otherwise materially harm our business.

Certain lawsuits were filed in connection with the Merger Agreement and the Merger which have since been voluntarily dismissed. However, additional lawsuits may also be filed challenging the disclosures contained in the proxy statement and/or challenging other aspects of the proposed acquisition by Illumina. Regardless of the outcome of any future litigation related to the proposed acquisition by Illumina, such litigation may be time-consuming and expensive and may distract our management from running the day-to-day operations of our business. The litigation costs and diversion of management's attention and resources to address the claims and counterclaims in any litigation related to the proposed acquisition by Illumina may materially adversely affect our business, financial condition and operating results. Litigation related to the proposed acquisition may result in negative publicity or an unfavorable impression of us, which could adversely affect the price of our common stock, impair our ability to recruit or retain employees, damage our relationships with our customers and suppliers, or otherwise materially harm our operations and financial performance.

Unfavorable global economic or political conditions could adversely affect our business, financial condition or results of operations.

General conditions in the global economy and in the global financial markets could adversely affect our results of operations, the overall demand for nucleic acid sequencing products may be particularly vulnerable to unfavorable economic conditions. A global financial crisis or a global or regional political disruption could cause extreme volatility in the capital and credit markets. A severe or prolonged economic downturn or political disruption could result in a variety of risks to our business, including weakened demand for our lead product candidates or any future product candidates, if approved, and our ability to raise additional capital when needed on acceptable terms, if at all. A weak or declining economy or political disruption could also strain our manufacturers or suppliers, possibly resulting in supply disruption, or cause our customers to delay making payments for our services. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the political or economic climate and financial market conditions could adversely impact our business.

We have limited experience as a commercial company and the commercialization and sales of our current or future products may be unsuccessful or less successful than anticipated.

Our first commercial product launched in 2011 and we have had limited sales to date. As such, we have limited historical financial data upon which to base our projected revenue, planned operating expenses or upon which to evaluate our company and our commercial prospects. Furthermore, in September 2015, we launched the PacBio Sequel® System, and concurrently began phasing out production of PacBio RS II instruments, and we announced the commercial launch of the Sequel II System in April 2019. Based on our limited experience in developing and marketing our existing products and launching new products, we may not be able to effectively:

- manage the timeliness of our new product introductions, including the SMRT Cell 8M and Sequel II System, and the rate at which sales of our new products may cannibalize sales of our older products;
- drive adoption of our current and future products, including the Sequel II System;
- attract and retain customers for our products;
- provide appropriate levels of customer training and support for our products;
- implement an effective marketing strategy to promote awareness of our products;
- develop and implement an effective sales and distribution strategy for our current and future products;
- develop, manufacture and commercialize new products or achieve an acceptable return on our manufacturing or research and development efforts and expenses;
- comply with regulatory requirements applicable to our products;
- anticipate and adapt to changes in our market;
- accommodate customer expectations and demands with respect to our products, increase product adoption by our existing customers or develop new customer relationships;
- grow our share by marketing and selling our products for new and additional applications;
- maintain and develop strategic relationships with vendors, manufacturers and other industry partners to acquire necessary materials for the production of, and to develop, manufacture and commercialize, our existing or future products;
- adapt or scale our manufacturing activities to meet potential demand at a reasonable cost;
- avoid infringement and misappropriation of third-party intellectual property;
- obtain and maintain any necessary licenses to third-party intellectual property on commercially reasonable terms;
- obtain valid and enforceable patents that give us a competitive advantage or enforce existing patents;
- protect our proprietary technology; and
- attract, retain and motivate qualified personnel.

The risks noted above, especially with respect to the marketing, sales, and commercialization of our products (including into the markets that Roche would have addressed), may be heightened by the termination of our development, commercialization and license agreement with Roche, which became effective as of the first quarter of 2017. In addition, a high percentage of our expenses is and will continue to be fixed. Accordingly, if we do not generate revenue as and when anticipated, our losses may be greater than expected and our operating results will suffer.

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

We have incurred net losses since inception and we cannot be certain if or when we will produce sufficient revenue from our operations to support our costs. While we achieved profitability for the quarter ended September 30, 2015, this

result was largely due to a one-time gain on lease amendments. We have incurred net losses for all other fiscal periods, and, even if profitability is achieved in the future, we may not be able to sustain profitability on a consistent basis. We expect to continue to incur substantial losses and negative cash flow from operations for the foreseeable future.

We are not cash flow positive and may not have sufficient cash to fund our current and planned operations.

Our operations have consumed substantial amounts of cash since inception, and we expect to continue to incur substantial losses and negative cash flow from operations for the foreseeable future. We believe that our growth will depend, in part, on our ability to fund our commercialization efforts and our efforts to develop new products, including the new SMRT Cell 8M and Sequel II System. Our existing resources may not allow us to conduct all of these activities that we believe would be beneficial for our future growth. As a result, we may need to raise additional funds through public or private debt or equity financing or alternative financing arrangements, which may include collaborations or licensing arrangements. In the event that we enter into collaborations or licensing arrangements to raise capital, we may be required to accept unfavorable terms. If we are unable to raise funds on favorable terms, or at all, we may have to reduce our cash burn rate and may not be able to support our commercialization efforts, or to increase or maintain the level of our research and development activities. If we are unable to generate sufficient cash flows or to raise adequate funds to finance our forecasted expenditures, we may have to make significant changes to our operations, including delaying or reducing the scope of or eliminating some or all of our development programs. We also may have to reduce sales, marketing, engineering, customer support or other resources devoted to our existing or new products, or cease operations. Any of these actions could impede our ability to achieve our business objectives and could materially harm our operating results.

We have continued to experience losses and, if that trend continues, we may need to seek additional sources of financing for various purposes, including:

- expanding the commercialization of our products and launching new products;
- funding our operations; and
- furthering our research and development.

Additional funds may not be available on terms acceptable to us or at all, particularly in light of restrictions under our debt agreement. We have incurred and may further incur additional debt. Debt holders have rights senior to common stockholders to make claims on our assets and the terms of our existing debt agreement restrict certain activities, including our ability to pay dividends on our common stock. We may not be able to issue equity securities due to unacceptable terms and conditions to us in the capital markets. To the extent that we raise additional funds through the sale of our common stock, continued downward fluctuations in our stock price could adversely affect such fundraising efforts. Furthermore, equity financings normally involve shares sold at a discount to the current market price, and fundraising through sales of additional shares of common stock or other equity securities will have a dilutive effect on our existing investors. The shares may also be sold at a time when the market price for our common stock is low because we are in need of the funds, which will further dilute existing holders more than if the market price for our common stock was higher.

If we are unable to successfully develop and timely manufacture our current and future products, including with respect to the Sequel System, the new SMRT Cell 8M and Sequel II System and related products, our business may be adversely affected.

In light of the highly complex technologies involved in our products, there can be no assurance that we will be able to manufacture and commercialize our current and future products on a timely basis or continue providing adequate support for our existing products. The commercial success of our products, including the Sequel and Sequel II Systems, depends on a number of factors, including performance and reliability of the system, our anticipating and effectively addressing customer preferences and demands, the success of our sales and marketing efforts, effective forecasting and management of product demand, purchase commitments and inventory levels, effective management of manufacturing and supply costs, and the quality of our products, including consumables such as SMRT Cells and reagents. Should we face delays in or discover unexpected defects during the further development or manufacturing process of instruments or consumables related to our products, including with respect to the new SMRT Cell 8M and Sequel II System, and including any delays or defects in software development or product functionality, the timing and success of the continued rollout and scaling of our products may be significantly impacted, which may materially and negatively impact our revenue and gross margin. The ability of our customers to successfully utilize our products will also depend on our ability to deliver high quality SMRT Cells and reagents, including with respect to the new SMRT Cell 8M. We have designed SMRT Cells and other consumables specifically for the Sequel System, and may need to develop in the future, other customized SMRT Cells and consumables for our future products, including the new SMRT Cell 8M for the Sequel II System. Our production of the SMRT Cells for the Sequel System has been and may in the future be below desired levels, and we have experienced and may experience in the future manufacturing delays, product or quality defects, SMRT Cell variability, and other issues, including unanticipated

delays and other issues in connection with our transition to the high-volume manufacturer. The performance of our consumables is critical to our customers' successful utilization of our products, and any defects or performance issues with our consumables would adversely affect our business. All of the foregoing could negatively impact our ability to sell our products or result in other material adverse effects on our business, financial condition and results of operations.

The development of our products is complex and costly. Problems in the design or quality of our products may have a material and adverse effect on our brand, business, financial condition, and operating results, and could result in us losing our certifications from the International Organization for Standardization ("ISO"). If we were to lose ISO certification, then our customers might choose not to purchase products from us and this could adversely impact our ability to develop products approved for clinical uses. Unanticipated problems with our products could divert substantial resources, which may impair our ability to support our new and existing products, and could substantially increase our costs. If we encounter development challenges or discover errors in our products late in our development cycle, we may be forced to delay product shipments or the scaling of manufacturing or supply. In particular, if the continued rollout of our current and future products, including with respect to the new SMRT Cell 8M and Sequel II System, is delayed or is not successful or less successful than anticipated, then we may not be able to achieve an acceptable return, if any, on our substantial research and development efforts, and our business may be materially and adversely affected. The expenses or losses associated with delayed or unsuccessful product development or lack of market acceptance of our existing and new products, including the new SMRT Cell 8M and Sequel II System, could materially and adversely affect our business, financial condition and results of operations.

Our research and development efforts may not result in the benefits that we anticipate, and our failure to successfully market, sell, and commercialize our current and future products could have a material adverse effect on our business, financial condition and results of operations.

We have dedicated significant resources to developing our current products, including sequencing systems and consumables based on our proprietary SMRT sequencing technology and our Sequel and Sequel II Systems. We are also engaged in substantial and complex research and development efforts, which, if successful, may result in the introduction of new products in the future, including with respect to the new SMRT Cell 8M and the Sequel II System. Our research and development efforts are complex and require us to incur substantial expenses. We may not be able to develop, manufacture and commercialize new products, obtain regulatory approval if necessary, or achieve an acceptable return, if any, on our research and development efforts and expenses. Furthermore, we need to continue to expand our internal capabilities or seek new partnerships or collaborations, or both, in order to successfully market, sell and commercialize our products in the markets we seek to reach.

We must successfully manage new product introductions and transitions, including with respect to the new SMRT Cell 8M and Sequel II System, we may incur significant costs during these transitions, and they may not result in the benefits we anticipate.

If our products and services fail to deliver the performance, scalability or results expected by our current and future customers, or are not delivered on a timely basis, our reputation and credibility may suffer, our current and future sales and revenue may be materially harmed and our business may not succeed. For instance, if we are not able to realize the benefits we anticipate from the development and commercialization of the Sequel System or our future products, including with respect to the new SMRT Cell 8M and Sequel II System and also those future products that may be developed for clinical uses, it could have a material adverse effect on our business, financial condition and results of operations. In addition, the introduction of future products, including with respect to the new SMRT Cell 8M and Sequel II System, has and may in the future lead to our limiting or ceasing development of further enhancements to our existing products as we focus our resources on new products, and has resulted and could in the future result in reduced marketplace acceptance and loss of sales of our existing products, materially adversely affecting our revenue and operating results. The introduction of new products has had and may in the future also have a negative impact on our revenue in the near-term as our current and future customers have delayed or cancelled and may in the future delay or cancel orders of existing products in anticipation of new products and we may also be pressured to decrease prices for our existing products. Further, we have experienced, and may in the future experience, difficulty in managing or forecasting customer reactions, purchasing decisions or transition requirements with respect to newly-launched products. We have incurred and may continue to incur significant costs in completing the transitions, including costs of write-downs of our products, as current or future customers' transition to new products. If we do not successfully manage these product transitions, including with respect to the new SMRT Cell 8M and Sequel II System, our business, reputation and financial condition may be materially and adversely affected.

Our success is highly dependent on our ability to further penetrate the existing market for nucleic acid sequencing as well as the growth and expansion of the market for our products. If our products fail to achieve and sustain sufficient market acceptance, we will not generate expected revenue and our business may not succeed.

Although nucleic acid sequencing technology is well-established, our Single Molecule, Real-Time (SMRT®) Sequencing technology is relatively new and evolving. We cannot be sure that our current or future products will gain acceptance in the marketplace at levels sufficient to support our costs. Our success depends, in part, on our ability to expand overall demand for nucleic acid sequencing to include new applications that are not practicable with other current technologies and to introduce new products that capture a larger share of growing overall demand for sequencing. To accomplish this, we must successfully commercialize, and continue development of, our proprietary SMRT Sequencing technology for use in a variety of life science and other applications, including uses by academic, government and clinical laboratories, as well as pharmaceutical, diagnostic, biotechnology and agriculture companies, among others. For example, the sale and commercialization of the new SMRT Cell 8M and Sequel II System, and related products may not be successful.

There can be no assurance that we will be successful in adding new products or securing additional customers for our current and future products, including with respect to the new SMRT Cell 8M and Sequel II System. Our ability to further penetrate existing applications and any new applications depends on a number of factors, including the cost, performance and perceived value associated with our products, as well as customers' willingness to adopt a different approach to nucleic acid sequencing. Potential customers may have already made significant investments in other sequencing technologies and may be unwilling to invest in new technologies. We have limited experience commercializing and selling products outside of the academic and research settings, and we cannot assure you that we can successfully acquire additional customers. Furthermore, we cannot guarantee that our products will be satisfactory to potential customers we seek to reach or that our products will perform in accordance with customer expectations.

These applications are new and dynamic, and there can be no assurance that they will develop as quickly as we anticipate, that they will reach their full potential or that they will be receptive to any of our products. As a result, we may be required to refocus our marketing efforts, and we may have to make changes to the specifications of our products to enhance our ability to enter particular applications more quickly. We may also need to delay full-scale commercial deployment of new products as we develop them in order to perform quality control and early access user testing, including with respect to the new SMRT Cell 8M and Sequel II System. Even if we are able to implement our technology successfully, we and/or our sales and distribution partners may fail to achieve or sustain market acceptance of our current or future products across the full range of our intended life science and other applications. We need to continue to expand and update our internal capabilities or to collaborate with other partners, or both, in order to successfully expand sales of our products in the applications that we seek to reach, which we may be unable to do at the scale required to support our business.

If the demand for our products grows more slowly than anticipated, if we are unable to successfully scale or otherwise ensure sufficient manufacturing capacity for new products to meet demand, if we are not able to successfully market and sell our products, if competitors develop better or more cost-effective products, if our product launches and commercialization are not successful, or if we are unable to further grow our customer base or do not realize the growth with existing customers that we are expecting, our current and future sales and revenue would be materially harmed and our business may not succeed.

We rely on other companies for the manufacture of certain components and sub-assemblies and intend to outsource additional sub-assemblies in the future. We may not be able to successfully scale the manufacturing process necessary to build and test multiple products on a full commercial basis, which could materially harm our business.

Our products are complex and involve a large number of unique components, many of which require precision in manufacturing. The nature of our products requires customized components that are currently available only from a limited number of sources, and in some cases, single sources. We have chosen to source certain critical components from a single source, including suppliers for our SMRT Cells, reagents and instruments. If we are required to purchase these components from alternative sources, it could take several months or longer to qualify the alternative sources. If we are unable to secure a sufficient supply of these product components on a timely basis, or if these components do not meet our expectations or specifications for quality and functionality, our operations and manufacturing will be materially and adversely affected, we could be unable to meet customer demand and our business and results of operations may be materially and adversely affected.

The operations of our third-party manufacturing partners and suppliers could be disrupted by conditions unrelated to our business or operations or that are beyond our control, including but not limited to international trade restrictions. If our manufacturing partners or suppliers are unable or fail to fulfill their obligations to us for any reason, we may not be able to manufacture our products and satisfy customer demand or our obligations under sales agreements in a timely manner, and our business could be harmed as a result. Our current manufacturing process is characterized by long lead times between the placement of orders for and delivery of our products. If we have received insufficient components to manufacture our

products on a timely basis to meet customer demand, our sales and our gross margin may be adversely affected and our business could be materially harmed. If we are unable to reduce our manufacturing costs and establish and maintain reliable, high-volume manufacturing suppliers as we scale our operations, our business could be materially harmed.

We may be unable to consistently manufacture our instruments and consumable kits, including SMRT Cells, to the necessary specifications or in quantities necessary to meet demand at an acceptable cost or at an acceptable performance level.

In order to successfully generate revenue from our products, we need to supply our customers with products that meet their expectations for quality and functionality in accordance with established specifications. Our customers have experienced variability in the performance of our products. We have experienced and may continue to experience delays, quality issues or other difficulties leading to customer dissatisfaction with our products. Our production of SMRT Cells involves a long and complex manufacturing process, has been and may in the future be below desired levels, and we have experienced and may experience in the future manufacturing delays, product defects, variability in the performance of SMRT Cells and other products, inadequate reserves for inventory, or other issues. There is no assurance that we will be able to manufacture our products so that they consistently achieve the product specifications and quality that our customers expect, including any products developed for clinical uses. Problems in the design or quality of our products, including low manufacturing yields of SMRT Cells, may have a material adverse effect on our brand, business, financial condition, and operating results, and could result is us losing our ISO certifications. If we were to lose our ISO certifications, then our customers might choose not to purchase products from us. There is also no assurance that we will be able to increase manufacturing yields and decrease costs, or that we will be successful in forecasting customer demand or manufacturing and supply costs. Furthermore, we may not be able to increase manufacturing to meet anticipated demand or may experience downtime in our manufacturing facilities. An inability to manufacture products and components that consistently meet specifications, in necessary quantities and at commercially acceptable costs, will have a negative impact, and may have a material adverse effect, on our business, financial condition and results of operations.

Rapidly changing technology in life sciences and diagnostics could make our products obsolete unless we continue to develop, manufacture and commercialize new and improved products and pursue new opportunities.

Our industry is characterized by rapid and significant technological changes, frequent new product introductions and enhancements and evolving industry standards. Our future success depends on our ability to continually improve our products, to develop and introduce new products that address the evolving needs of our customers on a timely and cost-effective basis and to pursue new opportunities. These new opportunities may be outside the scope of our proven expertise or in areas where demand is unproven, and new products and services developed by us may not gain market acceptance or may not adequately perform in order to capture market share. Our inability to develop and introduce new products and to gain market acceptance of our existing and new products could harm our future operating results. Unanticipated difficulties or delays in replacing existing products with new products or in commercializing our existing or new products in sufficient quantities and of acceptable quality to meet customer demand, including with respect to the new SMRT Cell 8M and Sequel II System, could diminish future demand for our products and materially harm our future operating results.

Increased market adoption of our products by customers may depend on the availability of sample preparation and informatics tools, some of which may be developed by third parties.

Our commercial success may depend in part upon the development of sample preparation and software and informatics tools by third parties for use with our products. We cannot guarantee that third parties will develop tools that our current and future customers will find useful with our products, or that customers will adopt such third-party tools on a timely basis or at all. A lack of complementary sample preparation and informatics tools, or delayed updates of such tools, may impede the adoption of our products and may materially and adversely impact our business.

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

There are a significant number of companies offering nucleic acid sequencing products and/or services, including Illumina (with whom we have entered into a definitive agreement to be acquired), BGI Genomics, Thermo, ONT Ltd., Roche, and Qiagen. Many of these companies currently have greater name recognition, more substantial intellectual property portfolios, longer operating histories, significantly greater financial, technical, research and/or other resources, more experience in new product development, larger and more established manufacturing capabilities and marketing, sales and support functions, and/or more established distribution channels to deliver products to customers than we do. These companies may be able to respond more quickly and effectively than we can to new or changing opportunities, technologies, standards or customer requirements.

There are also several companies that are in the process of developing or have already developed and commercialized new, competing or potentially competing technologies, products and/or services, including ONT Ltd. and its subsidiaries, against whom we have filed complaints for patent infringement in the U.S. District Court for the District of Delaware and, previously, with the U.S. International Trade Commission, in the High Court of England and Wales and in the District Court of Mannheim, Germany. ONT Ltd. previously filed claims against us in the High Court of England and Wales and the District Court of Mannheim, Germany, also for patent infringement, and its subsidiary, ONT, Inc., has filed counterclaims against us in the U.S. District Court for the District of Delaware seeking declaratory judgements of non-infringement, invalidity and unenforceability of the asserted patents, as well as antitrust, false advertising and unfair competition counterclaims that were subsequently dismissed by the Court. Roche is developing potentially competing sequencing products. Increased competition may result in pricing pressures, which could harm our sales, profitability or market share. Our failure to further enhance our existing products and to introduce new products to compete effectively could materially and adversely affect our business, financial condition or results of operations.

We may be unable to successfully increase sales of our current products or market and sell our future products.

Our ability to achieve profitability depends on our ability to attract customers for our current and future products, and we may be unable to effectively market or sell our products, or find appropriate partners to do so. To perform sales, marketing, distribution and customer support functions successfully, we face a number of risks, including:

- our ability to attract, retain and manage qualified sales, marketing and service personnel necessary to expand market acceptance for our technologies;
- the performance and commercial availability expectations of our existing and potential customers with respect to new and existing products;
- availability of potential sales and distribution partners to sell our technologies, and our ability to attract and retain such sales and distribution partners;
- the time and cost of maintaining and growing a specialized sales, marketing and service force for a particular application, which may be difficult to justify in light of the revenue generated; and
- our sales, marketing and service force may be unable to execute successful commercial activities.

We have enlisted and may continue to enlist third parties to assist with sales, distribution and customer support. There is no guarantee that we will be successful in attracting desirable sales and distribution partners, that we will be able to enter into arrangements with such partners on terms favorable to us or that we will be able to retain such partners on a going-forward basis. If our sales and marketing efforts, or those of any of our third-party sales and distribution partners, are not successful, or our products do not perform in accordance with customer expectations, our technologies and products may not gain market acceptance, which could materially impact our business operations.

Large purchases by a limited number of customers represent a significant portion of our revenue, and any loss or delay of expected purchases has resulted, and in the future could result, in material quarter-to-quarter fluctuations of our revenue or otherwise adversely affect our results of operations.

We receive a significant portion of our revenue from a limited number of customers. For example, for the three months ended March 31, 2019 and 2018, one of our customers, Gene Company Limited, accounted for approximately 17% and 29% of our total revenue, respectively. Gene Company Limited is our distributor in China. Many of these customers make large purchases on a purchase-order basis rather than pursuant to long-term contracts. As a consequence of the concentrated nature of our customer base and their purchasing behavior, our quarterly revenue and results of operations have fluctuated, and may fluctuate in the future, from quarter to quarter and are difficult to forecast. For example, the cancellation of orders or acceleration or delay in anticipated product purchases or the acceptance of shipped products by our larger customers has materially affected, and in the future could materially affect, our revenue and results of operations in any quarterly period. We have been, and may be in the future be, unable to sustain or increase our revenue from our larger customers, or offset any discontinuation or decrease of purchases by our larger customers with purchases by new or other existing customers. To the extent one or more of our larger customers experience significant financial difficulty, bankruptcy or insolvency, this could have a material adverse effect on our sales and our ability to collect on receivables, which could harm our financial condition and results of operations.

In addition, many of our customers, including some of our larger customers, have negotiated, or may in the future negotiate, volume-based discounts or other more favorable terms from us or our sales and distribution partners, which can and have had a negative effect on our gross margins or revenue.

We expect that such concentrated purchases will continue to contribute materially to our revenue for the foreseeable future and that our results of operations may fluctuate materially as a result of such larger customers' buying patterns. In addition, we may see consolidation of our customer base. The loss of one of our larger customers, a significant delay or reduction in its purchases, or any volume-based discount or other more favorable terms that we or our sales and distribution partner(s) may agree to provide in light of the aggregated purchase volume or buying power resulting from such consolidation, has harmed, and in the future could harm, our business, financial condition, results of operations and prospects.

Our indebtedness could adversely affect our financial condition and prevent us from fulfilling our obligations.

Our net losses since inception and our expectation of incurring substantial losses and negative cash flow for the foreseeable future, combined with our existing indebtedness, could:

- make it more difficult for us to satisfy our obligations, including under our existing debt agreement;
- increase our vulnerability to general adverse economic and industry conditions;
- limit our ability to fund future working capital, capital expenditures, research and development and other business opportunities;
- require us to dedicate a substantial portion of our cash flow from operations to service payments on our indebtedness;
- increase the volatility of the price of our common stock;
- limit our flexibility to react to changes in our business and the industry in which we operate;
- place us at a disadvantage to other companies that offer nucleic acid sequencing equipment or consumables and that have less or no indebtedness; and
- limit, along with the financial and other restrictive covenants in our indebtedness, among other things, our ability to borrow additional funds.

Our existing debt contains covenants which may adversely impact our business and our failure to comply with such covenants could cause our outstanding indebtedness to become immediately payable.

Our existing debt contains various affirmative and negative covenants, including restrictions on our and our subsidiaries' ability to incur additional indebtedness or liens on our assets. These covenants impose significant operating and financial restrictions on us, including restrictions on our ability to take certain actions that may be in our best interests.

A breach of any of the covenants contained in our debt could result in an event of default. If an event of default exists, debt holders could elect to declare all amounts outstanding under the debt to be immediately due and payable. If we are unable to repay our indebtedness when due and payable, debt holders could proceed against the collateral granted to them to secure such indebtedness. We have pledged substantially all of our property and interests in property, including our intellectual property, as collateral under our existing debt. If the debt holders accelerate the repayment of our indebtedness, we may not have sufficient funds to make such repayment, which could have a material adverse effect on our liquidity and ability to conduct our business.

In addition, at the election of the holders representing a majority of the aggregate principal amount of the outstanding notes issued pursuant to our existing debt agreement, the holders may elect to receive 25% of the net proceeds from any financing that includes an equity component, including, without limitation, the sale or issuance of our common stock, options, warrants or other securities convertible or exchangeable for shares of our common stock, as partial payment of the notes. This right is subject to certain exceptions set forth in our existing debt agreement. To the extent we raise additional capital in the future through the sale of common stock under any future "at-the-market" offering, underwritten offering or through other financing activities, we may be obligated, at the election of the holders of the notes, to pay 25% of the net proceeds from any such financing activities as partial payment of the notes.

Our products are highly complex, have recurring support requirements and could have unknown defects or errors, which may give rise to claims against us or divert application of our resources from other purposes.

Products using our SMRT sequencing technology are highly complex and may develop or contain undetected defects or errors. Our customers have experienced and may continue to experience reliability issues with our existing and future products, including the Sequel System. Despite testing, defects or errors may arise in our products, which could result in a failure to obtain, maintain or increase market acceptance of our products, diversion of development resources, injury to

our reputation and increased warranty, service and maintenance costs. New products, including the new SMRT Cell 8M and Sequel II System, or enhancements to our existing products in particular may contain undetected errors or performance problems that are discovered only after delivery to customers. If our products have reliability or other quality issues or require unexpected levels of support in the future, the market acceptance and utilization of our products may not grow to levels sufficient to support our costs and our reputation and business could be harmed. Low utilization rates of our products could cause our revenue and gross margins to be adversely affected. We generally ship our sequencing instruments with one year of service included in the purchase price with an option to purchase one or more additional years of service. We also provide a warranty for our consumables, which is generally limited to replacing, or at our option, giving credit for any consumable with defects in material or workmanship. Defects or errors in our products may also discourage customers from purchasing our products. The costs incurred in correcting any defects or errors may be substantial and could materially and adversely affect our operating margins. If our service and support costs increase, our business and operations may be materially and adversely affected.

In addition, such defects or errors could lead to the filing of product liability claims against us or against third parties who we may have an obligation to indemnify against such claims, which could be costly and time-consuming to defend and result in substantial damages. Although we have product liability insurance, any product liability insurance that we have or procure in the future may not protect our business from the financial impact of a product liability claim. Moreover, we may not be able to obtain adequate insurance coverage on acceptable terms. Any insurance that we have or obtain will be subject to deductibles and coverage limits. A product liability claim could have a serious adverse effect on our business, financial condition and results of operations.

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

Our success depends upon the continuing services of members of our senior management team and scientific and engineering personnel. In particular, our scientists and engineers are critical to our technological and product innovations and we will need to hire additional qualified personnel. Our industry, particularly in the San Francisco Bay Area, is characterized by high demand and intense competition for talent, and the turnover rate can be high. We compete for qualified management and scientific personnel with other life science companies, academic institutions and research institutions, particularly those focusing on genomics. Our employees could leave our company with little or no prior notice and would be free to work for a competitor. In addition, changes to U.S. immigration policies, particularly to H-1B and other visa programs, could restrain the flow of technical and professional talent into the U.S. and may inhibit our ability to hire qualified personnel. If one or more of our senior executives or other key personnel were unable or unwilling to continue in their present positions, we may not be able to replace them easily or at all, and other senior management may be required to divert attention from other aspects of the business. In addition, we do not have “key person” life insurance policies covering any member of our management team or other key personnel. The loss of any of these individuals or any inability to attract or retain qualified personnel, including scientists, engineers and others, could prevent us from pursuing collaborations and materially and adversely affect our support of existing products, product development and introductions, business growth prospects, results of operations and financial condition.

A significant portion of our sales depends on customers’ spending budgets that may be subject to significant and unexpected variation which could have a negative effect on the demand for our products.

Our instruments represent significant capital expenditures for our customers. Current and potential customers for our current or future products include academic and government institutions, genome centers, medical research institutions, clinical laboratories, pharmaceutical, agricultural, biotechnology, diagnostic and chemical companies. Their spending budgets can have a significant effect on the demand for our products. Spending budgets are based on a wide variety of factors, including the allocation of available resources to make purchases, funding from government sources which is highly uncertain and subject to change, the spending priorities among various types of research equipment and policies regarding capital expenditures during economically uncertain periods. Any decrease in capital spending or change in spending priorities of our current and potential customers could significantly reduce the demand for our products. Any delay or reduction in purchases by current or potential customers or our inability to forecast fluctuations in demand could harm our future operating results.

We may not be able to convert our orders in backlog into revenue.

Our backlog represents product orders from our customers that we have confirmed and for which we have not yet recognized revenue. We may not receive revenue from these orders, and any order backlog we report may not be indicative of our future revenue.

Many events can cause an order to be delayed or not completed at all, some of which may be out of our control. If we delay fulfilling customer orders or if customers reconsider their orders, those customers may seek to cancel or modify their orders with us. Customers may otherwise seek to cancel or delay their orders even if we are prepared to fulfill them. If our orders in backlog do not result in sales, our operating results may suffer.

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

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

We are, and may become, subject to governmental regulations that may impose burdens on our operations, and the markets for our products may be narrowed.

We are subject, both directly and indirectly, to the adverse impact of government regulation of our operations and markets. For example, export of our instruments may be subject to strict regulatory control in a number of jurisdictions. We have expanded and are continuing to expand the international jurisdictions into which we supply products, which increase the risks surrounding governmental regulations relating to our business. The failure to satisfy export control criteria or to obtain necessary clearances could delay or prevent shipment of products, which could materially and adversely affect our revenue and profitability. Moreover, the life sciences industry, which is expected to continue to be one of the primary markets for our technology, has historically been heavily regulated. There are, for example, laws in several jurisdictions restricting research in genetic engineering, which may narrow our markets. Given the evolving nature of this industry, legislative bodies or regulatory authorities may adopt additional regulations that may adversely affect our market opportunities. Additionally, if ethical and other concerns surrounding the use of genetic information, diagnostics or therapies become widespread, there may be less demand for our products.

Our business is also directly affected by a wide variety of government regulations applicable to business enterprises generally and to companies operating in the life science industry in particular. Failure to comply with government regulations or obtain or maintain necessary permits and licenses could result in a variety of fines or other censures or an interruption in our business operations which may have a negative impact on our ability to generate revenue and the cost of operating our business. In addition, changes to laws and government regulations could cause a material adverse effect on our business as we will need to adapt our business to comply with such changes. For example, a governmental prohibition on the use of human *in vitro* diagnostics would adversely impact our commercialization of products on which we have expended significant research and development resources, which would in turn have a material adverse impact on our business and prospects.

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

Our products are not currently subject to U.S. Food and Drug Administration ("FDA") clearance or approval since they are not intended for use in the diagnosis or treatment of disease. However, in the future, certain of our products or related applications, such as those that may be developed for clinical uses, could be subject to FDA regulation, or the FDA's regulatory jurisdiction could be expanded to include our products. Even where a product is exempted from FDA clearance or approval, the FDA may impose restrictions as to the types of customers to which we or our partners can market and sell our products. Such regulation and restrictions may materially and adversely affect our business, financial condition and results of operations. In the event that we fail to obtain and maintain necessary regulatory clearances or approvals for products that we develop for clinical uses, or if clearances or approvals for future products and indications are delayed or not issued, our commercial operations may be materially harmed. Furthermore, even if we are granted regulatory clearances or approvals, they may include significant limitations on the indicated uses for the product, which may limit the market for the product. We do not have experience in obtaining FDA approvals and no assurance can be given that we will be able to obtain or to maintain such approvals. Furthermore, any approvals that we may obtain can be revoked if safety or efficacy problems develop.

Many countries have laws and regulations that could affect our products, such as 510(k) clearances, premarket approvals or CE Mark requirements, and failure to adhere to applicable statutory or regulatory requirements by us or our business partners would have a material adverse effect on our operations and financial condition. The number and scope of these requirements are increasing. Unlike many of the other companies offering nucleic acid sequencing equipment or consumables, this is an area where we do not have expertise. We, or our other third-party sales and distribution partners, may not be able to obtain regulatory approvals in such countries or may incur significant costs in obtaining or maintaining our foreign regulatory approvals. In addition, the export by us of certain of our products, which have not yet been cleared for domestic commercial distribution, may be subject to FDA or other export restrictions. Any action brought against us for violations of these laws or regulations, even if successfully defended, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business.

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

We currently conduct operations in various countries and jurisdictions, and continue to expand to new international jurisdictions as part of our growth strategy and have experienced an increasing concentration of sales in certain regions outside the U.S., especially the Asia-Pacific region. We sell directly and through distribution partners throughout Europe, the Asia-Pacific region, Mexico, and South Africa and have a significant portion of our sales and customer support personnel in Europe and the Asia-Pacific region. As a result, we or our distribution partners may be subject to additional regulations and increased diversion of management time and efforts. Conducting and launching operations on an international scale requires close coordination of activities across multiple jurisdictions and time zones and consumes significant management resources. If we fail to coordinate and manage these activities effectively, our business, financial condition or results of operations could be materially and adversely affected and failure to comply with laws and regulations applicable to business operations in foreign jurisdictions may also subject us to significant liabilities and other penalties. International operations entail a variety of other risks, including, without limitation:

- challenges in staffing and managing foreign operations;
- potentially longer sales cycles and more time required to engage and educate customers on the benefits of our platform outside of the United States;
- the potential need for localized software and documentation;
- reduced protection for intellectual property rights in some countries and practical difficulties of enforcing intellectual property and contract rights abroad;
- restriction on cross-border investment, including enhanced oversight by the Committee on Foreign Investment in the United States (CFIUS) and substantial restrictions on investment from China;
- U.S. and foreign government trade restrictions, including those which may impose restrictions on the importation, exportation, reexportation, sale, shipment or other transfer of programming, technology, components, and/or services to foreign persons;
- changes in diplomatic and trade relationships, including new tariffs, trade protection measures, import or export licensing requirements, trade embargoes and other trade barriers;

- tariffs imposed by the U.S. on goods from other countries and tariffs imposed by other countries on U.S. goods, including the recently implemented tariffs and additional tariffs that have been proposed by the U.S. government on various imports from China, Canada, Mexico and the EU and by the governments of these jurisdictions on certain U.S. goods, and any other possible tariffs that may be imposed on products such as ours, the scope and duration of which, if implemented, remains uncertain;
- deterioration of political relations between the U.S. and Canada, the U.K. and the EU, which could have a material adverse effect on our sales and operations in these countries;
- changes in social, political and economic conditions or in laws, regulations and policies governing foreign trade, manufacturing, development and investment both domestically as well as in the other countries and jurisdictions into which we sell our products, including as a result of the referendum held in the United Kingdom approving the withdrawal of the United Kingdom from the European Union;
- difficulties in obtaining export licenses or in overcoming other trade barriers and restrictions resulting in delivery delays;
- fluctuations in currency exchange rates and the related effect on our results of operations;
- increased financial accounting and reporting burdens and complexities;
- potential increases on tariffs or restrictions on trade generally; and
- significant taxes or other burdens of complying with a variety of foreign laws, including laws relating to privacy and data protection such as the EU General Data Protection Regulation (“GDPR”) which took effect in the European Union in 2018.

In conducting our international operations, we are subject to U.S. laws relating to our international activities, such as the Foreign Corrupt Practices Act of 1977, as well as foreign laws relating to our activities in other countries, such as the United Kingdom Bribery Act of 2010. Additionally, the inclusion of one of our foreign customers on any U.S. Government sanctioned persons list, including but not limited to the U.S. Department of Commerce’s List of Denied Persons and the U.S. Department of Treasury’s List of Specially Designated Nationals and Blocked Persons List, could be material to our earnings. Failure to comply with these laws may subject us to claims or financial and/or other penalties in the United States and/or foreign countries that could materially and adversely impact our operations or financial condition. These risks have become increasingly prevalent as we have expanded our sales into countries that are generally recognized as having a higher risk of corruption.

We face risks related to the current global economic environment, which could delay or prevent our customers from purchasing our products, which could in turn harm our business, financial condition and results of operations. The state of the global economy continues to be uncertain. The current global economic conditions and uncertain credit markets and concerns regarding the availability of credit pose a risk that could impact customer demand for our products, as well as our ability to manage normal commercial relationships with our customers, suppliers and creditors, including financial institutions. If the current global economic environment deteriorates, our business could be negatively affected.

Moreover, changes in the value of the relevant currencies may affect the cost of certain items required in our operations. Changes in currency exchange rates may also affect the relative prices at which we are able sell products in the same market. Our revenue from international customers may be negatively impacted as increases in the U.S. dollar relative to our international customers’ local currencies could make our products more expensive, impacting our ability to compete or as a result of financial or other instability in such locations which could result in decreased sales of our products. Our costs of materials from international suppliers may also increase as the value of the U.S. dollar decreases relative to their local currency. Foreign policies and actions regarding currency valuation could result in actions by the United States and other countries to offset the effects of such fluctuations. Such actions may materially and adversely impact our financial condition and results of operations.

Violations of complex foreign and U.S. laws and regulations could result in fines and penalties, criminal sanctions against us, our officers, or our employees, prohibitions on the conduct of our business and on our ability to offer our products and services in one or more countries, and could also materially affect our brand, our international growth efforts, our ability to attract and retain employees, our business, and our operating results. Even if we implement policies or procedures designed to ensure compliance with these laws and regulations, there can be no assurance that our distribution partners, our employees, contractors, or agents will not violate our policies and subject us to potential claims or penalties.

Enhanced trade tariffs, import restrictions, export restrictions, Chinese regulations or other trade barriers may materially harm our business.

We are continuing to expand our international operations as part of our growth strategy and have experienced an increasing concentration of sales in certain regions outside the U.S., especially the Asia-Pacific region. There is currently significant uncertainty about the future relationship between the United States and various other countries, most significantly China, with respect to trade policies, treaties, government regulations and tariffs. The current U.S. presidential administration has called for substantial changes to U.S. foreign trade policy with respect to China and other countries, including the possibility of imposing greater restrictions on international trade and significant increases in tariffs on goods imported into the United States. In September 2018, the U.S. Trade Representative (the "USTR") enacted a tariff of 10% on the import of other Chinese products, including non-U.S. components and materials that may be used in our products and the countries continue to negotiate a trade deal. These tariffs may raise our cost of goods. Furthermore, tariffs, trade restrictions, or trade barriers that have been, and may in the future be, placed on products such as ours by foreign governments, especially China, have raised, and could further raise, amounts paid for some or all of our products, which may result in the loss of customers and our business, and our financial condition and results of operations may be harmed. Additionally, the current U.S. presidential administration continues to signal that it may alter trade agreements and terms between China and the United States, including limiting trade with China, and may impose additional tariffs on imports from China. Therefore, it is possible further tariffs may be imposed that could cover imports of components and materials used in our products, or our business may be adversely impacted by retaliatory trade measures taken by China or other countries, including restricted access to components or materials used in our products or increased amounts that must be paid for our products, which could materially harm our business, financial condition and results of operations. Further, the continued threats of tariffs, trade restrictions and trade barriers could have a generally disruptive impact on the global economy and, therefore, negatively impact our sales. Given the relatively fluid regulatory environment in China and the United States and uncertainty how the U.S. or foreign governments will act with respect to tariffs, international trade agreements and policies, there could be additional tax or other regulatory changes in the future. Any such changes could directly and adversely impact our financial results and results of operations.

Additionally, in November 2018, the U.S. Commerce Department's Bureau of Industry and Security ("BIS") released an advance notice of proposed rulemaking to control the export of emerging technologies. This notice included "[b]iotechnology, including nanobiology; synthetic biology; genomic and genetic engineering; or neurotech" as possible areas of increased export controls. Therefore, it is possible that our ability to export our products may be restricted in the future.

Our business could be negatively impacted by changes in the United States political environment.

There is significant ongoing uncertainty with respect to potential legislation, regulation and government policy at the federal level, as well as the state and local levels. Any such changes could significantly impact our business as well as the markets in which we compete. Specific legislative and regulatory proposals discussed during election campaigns and more recently that might materially impact us include, but are not limited to, changes to spending priorities and potential reductions in research funding. Uncertainty about U.S. government funding has posed, and may continue to pose, a risk as customers may choose to postpone or reduce spending in response to actual or anticipated restraints on funding. To the extent changes in the political environment have a negative impact on us or on our markets, our business, results of operation and financial condition could be materially and adversely impacted in the future.

Our sales cycle is unpredictable and lengthy, which makes it difficult to forecast revenue and may increase the magnitude of quarterly or annual fluctuations in our operating results.

The sales cycle for our sequencing instruments is lengthy because they represent a major capital expenditure and generally require the approval of our customers' senior management. This may contribute to substantial fluctuations in our quarterly or annual operating results, particularly during the periods in which our sales volume is low. Factors that may cause fluctuations in our quarterly or operating results include, without limitation, market acceptance for our products; our ability to attract new customers; publications of studies by us, competitors or third parties; the timing and success of new product introductions by us or our competitors or other changes in the competitive dynamics of our industry, such as consolidation; the amount and timing of our costs and expenses; changes in our pricing policies or those of our competitors; general economic, industry and market conditions; the effects of seasonality; the regulatory environment; expenses associated with warranty costs or unforeseen product quality issues; the hiring, training and retention of key employees, including our ability to grow our sales organization; litigation or other claims against us for intellectual property infringement or otherwise; our ability to obtain additional financing as necessary; and changes or trends in new technologies and industry standards. Because of these fluctuations, it is likely that in some future quarters our operating results will fall below the expectations of securities analysts or investors. If that happens, the market price of our stock would likely decrease. Past fluctuations in our quarterly and annual operating results have resulted in decreases in our stock price. Such fluctuations also mean that investors may not be able to rely on our operating results in any particular period as an indication of future performance. Sales to existing customers and the establishment of a business relationship with other potential

customers is a lengthy process, generally taking several months and sometimes longer. Following the establishment of the relationship, the negotiation of purchase terms can be time-consuming, and a potential customer may require an extended evaluation and testing period. In anticipation of product orders, we may incur substantial costs before the sales cycle is complete and before we receive any customer payments. As a result, in the event that a sale is not completed or is canceled or delayed, we may have incurred substantial expenses, making it more difficult for us to become profitable or otherwise negatively impacting our financial results. Furthermore, because of our lengthy sales cycle, the realization of revenue from our selling efforts may be substantially delayed, our ability to forecast our future revenue may be more limited and our revenue may fluctuate significantly from quarter to quarter.

Seasonality may cause fluctuations in our revenue and results of operations.

We operate on a December 31st year-end and believe that there are significant seasonal factors which may cause sales of our products, and particularly our sequencing instruments, to vary on a quarterly or yearly basis, contribute to the lengthy sales cycle for our sequencing instruments, and increase the magnitude of quarterly or annual fluctuations in our operating results. We believe that this seasonality results from a number of factors, including the procurement and budgeting cycles of many of our customers, especially government-funded customers, which cycles often coincide with government fiscal year ends. For example, the U.S. government's fiscal year-end occurs in our third quarter and may result in increased sales of our products during this quarter if government-funded customers have unused funds that may be forfeit, or future budgets that may be reduced, if such funds remain unspent at such fiscal year-end. Furthermore, celebrations of the Lunar New Year, which occurs during our first quarter, may last for a week or longer, during which time many of our customers' offices in China and elsewhere in the Asia-Pacific region may be closed due to the holiday, and have in the past caused, and may in the future cause, decreased sales of our consumables during such quarter. These factors have contributed, and may contribute in the future, to substantial fluctuations in our quarterly operating results. Because of these fluctuations, it is possible that in some quarters our operating results will fall below the expectations of securities analysts or investors. If that happens, the market price of our stock would likely decrease. These fluctuations, among other factors, also mean that our operating results in any particular period may not be relied upon as an indication of future performance. Seasonal or cyclical variations in our sales have in the past, and may become in the future, more, or less pronounced over time, and have in the past materially affected, and may in the future materially affect, our business, financial condition, results of operations and prospects.

If we fail to comply with healthcare and other governmental regulations, we could face substantial penalties and our business, results of operations and financial condition could be adversely affected.

The products that we may develop for clinical uses may be highly regulated, and there can be no assurance that the regulatory environment in which we would operate will not change significantly and adversely in the future. Any arrangements with physicians, hospitals and clinics may expose us to broadly applicable fraud and abuse and other laws and regulations that may restrict the financial arrangements and relationships through which we market, sell and distribute our products and services. Our employees, consultants, and commercial partners may engage in misconduct or other improper activities, including non-compliance with regulatory standards and requirements. Federal and state healthcare and other laws and regulations that may affect our ability to conduct business, include, without limitation:

- federal and state laws and regulations regarding billing and claims payment applicable to products that we may develop for clinical uses, and regulatory agencies enforcing those laws and regulations;
- the federal Anti-Kickback Statute, which prohibits, among other things, any person from knowingly and willfully offering, soliciting, receiving or providing remuneration, directly or indirectly, in exchange for or to induce either the referral of an individual for, or the purchase, order or recommendation of, any good or service for which payment may be made under federal healthcare programs;
- the federal False Claims Act, which prohibits, among other things, individuals or entities from knowingly presenting, or causing to be presented, false claims, or knowingly using false statements, to obtain payment from the federal government;
- federal criminal laws that prohibit executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- the FCPA, the U.K. Bribery Act of 2010, and other local anti-corruption laws that apply to our international activities;
- the federal Physician Payment Sunshine Act, or Open Payments, created under the Affordable Care Act, and its implementing regulations, which requires manufacturers of drugs, medical devices, biologicals and medical supplies for which payment is available under Medicare, Medicaid, or the Children's Health Insurance Program to report annually to the U.S. Department of Health and Human Services, or HHS, information related to payments or other transfers of value made to licensed physicians and teaching

hospitals, as well as ownership and investment interests held by physicians and their immediate family members;

- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, and its implementing regulations, and other laws and regulations relating to privacy and data protection including the European Union's new GDPR, which impose certain requirements relating to the privacy, security and transmission of individually identifiable health information; HIPAA also created criminal liability for knowingly and willfully falsifying or concealing a material fact or making a materially false statement in connection with the delivery of or payment for healthcare benefits, items or services;
- the federal physician self-referral prohibition, commonly known as the Stark Law; and
- state law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payor, including commercial insurers, and state and foreign laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

The Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act, or Affordable Care Act, was enacted in 2010. The Affordable Care Act, among other things, amends the intent requirement of the federal Anti-Kickback Statute and criminal healthcare fraud statutes. A person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it. In addition, the Affordable Care Act provides that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act.

Because of the breadth of these laws and the narrowness of available statutory and regulatory exemptions, it is possible that some of our activities could be subject to challenge under one or more of such laws. Any action brought against us for violations of these laws or regulations, even successfully defended, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. We may be subject to private "qui tam" actions brought by individual whistleblowers on behalf of the federal or state governments, with potential liability under the federal False Claims Act including mandatory treble damages and significant per-claim penalties.

The growth of our business and sales organization and our expansion outside of the United States may increase the potential of violating these laws. The risk of our being found in violation of these or other laws and regulations is further increased by the fact that many have not been fully interpreted by the regulatory authorities or the courts, and their provisions are open to a variety of interpretations. Any action brought against us for violation of these or other laws or regulations, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. If our operations are found to be in violation of any of the federal, state and foreign laws described above or any other current or future fraud and abuse or other healthcare laws and regulations that apply to us, we may be subject to penalties, including significant criminal, civil, and administrative penalties, damages, fines, imprisonment, for individuals, exclusion from participation in government programs, such as Medicare and Medicaid, and we could be required to curtail or cease certain of our operations. Any of the foregoing consequences could seriously harm our business and our financial results.

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

Ensuring that we have adequate internal financial and accounting controls and procedures in place to produce accurate financial statements on a timely basis is a costly and time-consuming effort that needs to be evaluated frequently. We may in the future discover areas of our internal financial and accounting controls and procedures that need improvement. Operating as a public company requires sufficient resources within the accounting and finance functions in order to produce timely financial information, ensure the level of segregation of duties, and maintain adequate internal control over financial reporting customary for a U.S. public company.

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

Pursuant to Section 404 of the Sarbanes-Oxley Act, we perform periodic evaluations of our internal control over financial reporting. While we have in the past performed this evaluation and concluded that our internal control over financial reporting was operating effectively, there can be no assurance that in the future material weaknesses or significant deficiencies will not exist or otherwise be discovered. In addition, if we are unable to produce accurate financial statements on a timely basis, investors could lose confidence in the reliability of our financial statements, which could cause the market price of our common stock to decline and make it more difficult for us to finance our operations and growth.

Our ability to use net operating losses to offset future taxable income may be subject to substantial limitations, and changes to U.S. tax laws may cause us to make adjustments to our financial statements.

Under Section 382 of the Internal Revenue Code, a corporation that undergoes an "ownership change" is subject to limitations on its ability to utilize its pre-change net operating losses ("NOLs") to offset future taxable income. We believe that we have had one or more ownership changes, as a result of which our existing NOLs are currently subject to limitation. Future changes in our stock ownership could result in additional ownership changes under Section 382. We may not be able to utilize a material portion of our NOLs even if we attain profitability. Furthermore, the changes to deductions, credits and expense recognition resulting from the Tax Cuts and Jobs Act of 2018 enacted on December 22, 2017 have materially impacted the value of our deferred tax assets and liabilities, and could adversely affect our future taxable income and effective tax rate.

Our operations involve the use of hazardous materials, and we must comply with environmental, health and safety laws, which can be expensive and may adversely affect our business, operating results and financial condition.

Our research and development and manufacturing activities involve the use of hazardous materials, including chemicals and biological materials, and some of our products include hazardous materials. Accordingly, we are subject to federal, state, local and foreign laws, regulations and permits relating to environmental, health and safety matters, including, among others, those governing the use, storage, handling, exposure to and disposal of hazardous materials and wastes, the health and safety of our employees, and the shipment, labeling, collection, recycling, treatment and disposal of products containing hazardous materials. Liability under environmental laws and regulations can be joint and several and without regard to fault or negligence. For example, under certain circumstances and under certain environmental laws, we could be held liable for costs relating to contamination at our or our predecessors' past or present facilities and at third-party waste disposal sites. We could also be held liable for damages arising out of human exposure to hazardous materials. There can be no assurance that violations of environmental, health and safety laws will not occur as a result of human error, accident, equipment failure or other causes. The failure to comply with past, present or future laws could result in the imposition of substantial fines and penalties, remediation costs, property damage and personal injury claims, investigations, the suspension of production or product sales, loss of permits or a cessation of operations. Any of these events could harm our business, operating results and financial condition. We also expect that our operations will be affected by new environmental, health and safety laws and regulations on an ongoing basis, or more stringent enforcement of existing laws and regulations. New laws or changes to existing laws may result in additional costs and may increase penalties associated with violations or require us to change the content of our products or how we manufacture them, which could have a material adverse effect on our business, operating results and financial condition.

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

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

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

Our products may be used to provide genetic information about humans, agricultural crops and other living organisms. The information obtained from our products could be used in a variety of applications which may have underlying ethical, legal, privacy and social concerns, including the genetic engineering or modification of agricultural products or testing for genetic predisposition for certain medical conditions. Governmental authorities could, for safety,

social or other purposes, call for limits on or regulation of the use of genetic testing. Such concerns or governmental restrictions could limit the use of our products, which could have a material adverse effect on our business, financial condition and results of operations.

Disruption of critical information technology systems or material breaches in the security of our systems could harm our business, customer relations and financial condition.

Information technology ("IT") helps us to operate efficiently, interface with customers, maintain financial accuracy and efficiently and accurately produce our financial statements. IT systems are used extensively in virtually all aspects of our business, including sales forecast, order fulfillment and billing, customer service, logistics, and management of data from running samples on our products. Our success depends, in part, on the continued and uninterrupted performance of our IT systems. IT systems may be vulnerable to damage from a variety of sources, including telecommunications or network failures, power loss, natural disasters, human acts, computer viruses, computer denial-of-service attacks, unauthorized access to customer or employee data or company trade secrets, and other attempts to harm our systems. Certain of our systems are not redundant, and our disaster recovery planning is not sufficient for every eventuality. Despite any precautions we may take, such problems could result in, among other consequences, disruption of our operations, which could harm our reputation and financial results.

If we do not allocate and effectively manage the resources necessary to build and sustain the proper IT infrastructure, we could be subject to transaction errors, processing inefficiencies, loss of customers, business disruptions or loss of or damage to intellectual property through security breach. If our data management systems do not effectively collect, store, process and report relevant data for the operation of our business, whether due to equipment malfunction or constraints, software deficiencies or human error, our ability to effectively plan, forecast and execute our business plan and comply with applicable laws and regulations will be impaired, perhaps materially. Any such impairment could materially and adversely affect our reputation, financial condition, results of operations, cash flows and the timeliness with which we report our internal and external operating results.

Security breaches and other disruptions could compromise our information and expose us to liability, which would cause our business and reputation to suffer.

In the ordinary course of our business, we collect and store sensitive data, including intellectual property, our proprietary business information and that of our customers, suppliers and business partners, and personally identifiable information of our customers and employees, in our data centers and on our networks. The secure processing, maintenance and transmission of this information is critical to our operations. Despite our security measures, our IT infrastructure may be vulnerable to attacks by hackers, computer viruses, malicious codes, unauthorized access attempts, and cyber- or phishing-attacks, or breached due to employee error, malfeasance, faulty password management or other disruptions. Third parties may attempt to fraudulently induce employees or other persons into disclosing user names, passwords or other sensitive information, which may in turn be used to access our IT systems, commit identity theft or carry out other unauthorized or illegal activities. Any such breach could compromise our networks and the information stored there could be accessed, publicly disclosed, lost or stolen. Any such access, disclosure or other loss of information could result in legal claims or proceedings, liability under laws that protect the privacy of personal information, disruption of our operations and damage to our reputation, which could divert our management's attention from the operation of our business and materially and adversely affect our business, revenues and competitive position. Moreover, we may need to increase our efforts to train our personnel to detect and defend against cyber- or phishing-attacks, which are becoming more sophisticated and frequent, and we may need to implement additional protective measures to reduce the risk of potential security breaches, which could cause us to incur significant additional expenses.

Regulations related to conflict minerals has caused us to incur, and will continue to cause us to incur, additional expenses and could limit the supply and increase the costs of certain materials used in the manufacture of our products.

We are subject to requirements under the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 that require us to conduct diligence, and report whether or not our products contain conflict minerals. The implementation of these requirements could adversely affect the sourcing, availability and pricing of the materials used in the manufacture of components used in our products. Furthermore, the complex nature of our products requires components and materials that may be available only from a limited number of sources and, in some cases, from only a single source. We have incurred, and will continue to incur, additional costs to comply with the disclosure requirements, including costs related to conducting diligence procedures to determine the sources of conflict minerals that may be used or necessary to the production of our products and, if applicable, potential changes to components, processes or sources of supply as a consequence of such verification activities. We may face reputational harm if we determine that certain of our products contain minerals that are not determined to be conflict free or if we are unable to alter our processes or sources of supply to avoid using such materials. Reputational harm could materially and adversely affect our business, financial condition or results of operations.

Risks Related to Our Intellectual Property

Failure to secure patent or other intellectual property protection for our products and improvements to our products may reduce our ability to maintain any technological or competitive advantage over our current and potential competitors.

Our ability to protect and enforce our intellectual property rights is uncertain and depends on complex legal and factual questions. Our ability to establish or maintain a technological or competitive advantage over our competitors may be diminished because of these uncertainties. For example:

- we or our licensors might not have been the first to make the inventions covered by each of our pending patent applications or issued patents;
- we or our licensors might not have been the first to file patent applications for these inventions;
- it is possible that neither our pending patent applications nor the pending patent applications of our licensors will result in issued patents;
- the scope of the patent protection we or our licensors obtain may not be sufficiently broad to prevent others from practicing our technologies, developing competing products, designing around our patented technologies or independently developing similar or alternative technologies;
- our and our licensors' patent applications or patents have been, are and may in the future be, subject to interference, opposition or similar administrative proceedings, which could result in those patent applications failing to issue as patents, those patents being held invalid or the scope of those patents being substantially reduced;
- our enforcement of patents and proprietary rights in other countries may be problematic or unpredictable;
- we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions;
- we or our partners may not adequately protect our trade secrets;
- we may not develop additional proprietary technologies that are patentable; or
- the patents of others may limit our freedom to operate and prevent us from commercializing our technology in accordance with our plans.

The occurrence of any of these events could impair our ability to operate without infringing upon the proprietary rights of others or prevent us from establishing or maintaining a competitive advantage over our competitors.

Variability in intellectual property laws may adversely affect our intellectual property position.

Intellectual property laws, and patent laws and regulations in particular, have been subject to significant variability either through administrative or legislative changes to such laws or regulations or changes or differences in judicial interpretation, and it is expected that such variability will continue to occur. Additionally, intellectual property laws and regulations differ by country. Variations in the patent laws and regulations or in interpretations of patent laws and regulations in the United States and other countries may diminish the value of our intellectual property and may change the impact of third-party intellectual property on us. Accordingly, we cannot predict the scope of the patents that may be

granted to us with certainty, the extent to which we will be able to enforce our patents against third parties or the extent to which third parties may be able to enforce their patents against us.

Some of the intellectual property that is important to our business is owned by other companies or institutions and licensed to us, and changes to the rights we have licensed may adversely impact our business.

We license from third parties some of the intellectual property that is important to our business. If we fail to meet our obligations under these licenses, or if we have a dispute regarding the terms of the licenses, these third parties could terminate the licenses. If the third parties who license intellectual property to us fail to maintain the intellectual property that we have licensed, or lose rights to that intellectual property, the rights we have licensed may be reduced or eliminated, which could subject us to claims of intellectual property infringement. Termination of these licenses or reduction or elimination of our licensed rights may result in our having to negotiate new or reinstated licenses with less favorable terms, or could subject us to claims of intellectual property infringement or contract breach in litigation or other administrative proceedings that could result in damage awards against us and injunctions that could prohibit us from selling our products. In addition, some of our licenses from third parties limit the field in which we can use the licensed technology. Therefore, in order for us to use such licensed technology in potential future applications that are outside the licensed field of use, we may be required to negotiate new licenses with our licensors or expand our rights under our existing licenses. We cannot assure you that we will be able to obtain such licenses or expanded rights on reasonable terms or at all. In the event a dispute with our licensors were to occur, our licensors may seek to renegotiate the terms of our licenses, increase the royalty rates that we pay to obtain and maintain those licenses, limit the field or scope of the licenses, or terminate the license agreements. In addition, we have limited rights to participate in the prosecution and enforcement of the patents and patent applications that we have licensed. As a result, we cannot be certain that these patents and applications will be prosecuted and enforced in a manner consistent with the best interests of our business. Further, because of the rapid pace of technological change in our industry, we may need to rely on key technologies developed or licensed by third parties, and we may not be able to obtain licenses and technologies from these third parties at all or on reasonable terms. The occurrence of these events may have a material adverse effect on our business, financial condition or results of operations.

The measures that we use to protect the security of and enforce our intellectual property and other proprietary rights may not be adequate, which could result in the loss of legal protection for, and thereby diminish the value of, such intellectual property and other rights.

In addition to patents, we also rely upon trademarks, trade secrets, copyrights and unfair competition laws, as well as license agreements and other contractual provisions, to protect our intellectual property and other proprietary rights. Despite these measures, any of our intellectual property rights could be challenged, invalidated, circumvented or misappropriated. In addition, we attempt to protect our intellectual property and proprietary information by requiring our employees and consultants to enter into confidentiality and assignment of inventions agreements, and by entering into confidentiality agreements with our third-party development, manufacturing, sales and distribution partners, who may also acquire, develop and/or commercialize alternative or competing products or provide services to our competitors. For example, Roche had certain access to our trade secrets and other proprietary information pursuant to our agreement with Roche, subject to the confidentiality provisions thereof (certain of which provisions survive the termination of the agreement); however, Roche is developing potentially competing sequencing products. There can be no assurance that our measures have provided or will provide adequate protection for our intellectual property and proprietary information. These agreements may be breached, and we may not have adequate remedies for any such breach. In addition, our trade secrets and other proprietary information may be disclosed to others, or others may gain access to or disclose our trade secrets and other proprietary information. Enforcing a claim that a third party illegally obtained and is using our trade secrets is expensive and time consuming, and the outcome is unpredictable. Additionally, others may independently develop proprietary information and techniques that are substantially equivalent to ours. The occurrence of these events may have a material adverse effect on our business, financial condition or results of operations.

Our intellectual property may be subject to challenges in the United States or foreign jurisdictions that could adversely affect our intellectual property position.

Our pending, issued and granted U.S. and foreign patents and patent applications have been, are and may in the future be, subject to challenges by ONT and other parties asserting prior invention by others or invalidity on various grounds, through proceedings, such as interferences, reexaminations or opposition proceedings. Addressing these challenges to our intellectual property has been, and any future challenges can be, costly and distract management’s attention and resources. For example, we previously incurred significant legal expenses to litigate and settle a complaint seeking review of a patent interference decision of the U.S. Patent and Trademark Office. Additionally, ONT has requested that the U.S. Patent and Trademark Office institute *inter partes* reviews of certain patents that we have asserted against ONT and ONT Ltd. in litigation proceedings for patent infringement. Additionally, as a result of these challenges, our patents or pending

patent applications may be determined to be unpatentable to us, invalidated or unenforceable in whole or in part. Accordingly, adverse rulings in these proceedings may negatively impact the scope of our intellectual property protection for our products and technology, and may materially and adversely affect our business.

Some of our technology is subject to "march-in" rights by the U.S. government.

Some of our patented technology was developed with U.S. federal government funding. When new technologies are developed with U.S. government funding, the government obtains certain rights in any resulting patents, including a nonexclusive license authorizing the government to use the invention for non-commercial purposes. These rights may permit the government to disclose our confidential information to third parties and to exercise "march-in" rights to use or allow third parties to use our patented technology. The government can exercise its march-in rights if it determines that such action is necessary to (i) achieve practical application of the U.S. government-funded technology, (ii) alleviate health or safety needs, (iii) meet requirements of federal regulations, or (iv) give preference to U.S. industry. In addition, U.S. government-funded inventions must be reported to the government and such government funding must be disclosed in any resulting patent applications. Furthermore, our rights in such inventions are subject to government license rights and foreign manufacturing restrictions.

We are involved in legal proceedings to enforce our intellectual property rights.

Our intellectual property rights involve complex factual, scientific and legal questions. We operate in an industry characterized by significant intellectual property litigation. Even though we may believe that we have a valid patent on a particular technology, other companies have from time to time taken, and may in the future take, actions that we believe violate our patent rights. For example, we are involved in legal proceedings for patent infringement and related matters with ONT in the United States, and we were previously involved in other legal proceedings with ONT and Harvard University in several United States and European jurisdictions. We have received adverse rulings against us with respect to our complaint with the USITC in one of these proceedings. Legal actions to enforce our patent rights have been, and will continue to be, expensive, and may divert significant management time and resources. Adverse parties from previous legal actions have brought, and may in the future bring, claims against us and/or our intellectual property. Litigation is a significant ongoing expense, recognized in sales, general and administrative expense, with an uncertain outcome, and has been, and may in the future be, a material expense for us. Our enforcement actions may not be successful, have given rise to legal claims against us and could result in some of our intellectual property rights being determined to be invalid or not enforceable. Furthermore, an adverse determination or judgement could lead to an award of damages against us, or the issuance of an injunction against us that could prevent us from selling any products found to be infringing the intellectual property rights of another party.

We have been, are currently, and could in the future be, subject to legal proceedings with third parties who may claim that our products infringe or misappropriate their intellectual property rights.

Our products are based on complex, rapidly developing technologies. We may not be aware of issued or previously filed patent applications that belong to third parties that mature into issued patents that cover some aspect of our products or their use. In addition, because patent litigation is complex and the outcome inherently uncertain, our belief that our products do not infringe third-party patents of which we are aware or that such third-party patents are invalid and unenforceable may be determined to be incorrect. As a result, third parties have claimed, and may in the future claim, that we infringe their patent rights and have filed, and may in the future file, lawsuits or engage in other proceedings against us to enforce their patent rights. For example, ONT Ltd. and Harvard University previously filed claims against us in the High Court of England and Wales and the District Court of Mannheim, Germany for patent infringement. We are aware of other issued patents and patent applications owned by third parties that could be construed to read on our products and services. Although we do not believe that our products or services infringe any valid issued patents, the third-party owners of these patents and applications may in the future claim that we infringe their patent rights and file lawsuits against us. In addition, as we enter new markets, our competitors and other third parties may claim that our products infringe their intellectual property rights as part of a business strategy to impede our successful entry into those markets. Furthermore, parties making claims against us may be able to obtain injunctive or other relief, which effectively could block our ability to develop further, commercialize, or sell products or services, and could result in the award of substantial damages against us. Patent litigation between competitors in our industry is common. Additionally, we have certain obligations to many of our customers and suppliers to indemnify and defend them against claims by third parties that our products or their use infringe any intellectual property of these third parties. In defending ourselves against any of these claims, we have in the past incurred, and could in the future incur, substantial costs, and the attention of our management and technical personnel could be diverted. For example, we previously incurred significant legal expenses to litigate and settle a complaint alleging patent infringement. Even if we have an agreement that indemnifies us against such costs, the indemnifying party may be unable to uphold its contractual obligations. To avoid or settle legal claims, it may be necessary or desirable in the future to obtain

licenses relating to one or more products or relating to current or future technologies, which could negatively affect our gross margins. We may not be able to obtain these licenses on commercially reasonable terms, or at all. We may be unable to modify our products so that they do not infringe the intellectual property rights of third parties. In some situations, the results of litigation or settlement of claims may require us to cease allegedly infringing activities which could prevent us from selling some or all of our products. The occurrence of these events may have a material adverse effect on our business, financial condition or results of operations.

In addition, in the course of our business, we may from time to time have access or be alleged to have access to confidential or proprietary information of others, which, though not patented, may be protected as trade secrets. Others could bring claims against us asserting that we improperly used their confidential or proprietary information, or that we misappropriated their technologies and incorporated those technologies into our products. A determination that we illegally used the confidential or proprietary information or misappropriated technologies of others in our products could result in us paying substantial damage awards or being prevented from selling some or all of our products, which could materially and adversely affect our business.

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

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

Our use of "open source" software could adversely affect our ability to sell our products and subject us to possible litigation.

A portion of the products or technologies developed and/or distributed by us incorporate "open source" software, and we may incorporate open source software into other products or technologies in the future. Some open source software licenses require that we disclose the source code for any modifications to such open source software that we make and distribute to one or more third parties, and that we license the source code for such modifications to third parties, including our competitors, at no cost. We monitor the use of open source software in our products to avoid uses in a manner that would require us to disclose or grant licenses under our source code that we wish to maintain as proprietary; however, there can be no assurance that such efforts have been or will be successful. In some circumstances, distribution of our software that includes or is linked with open source software could require that we disclose and license some or all of our proprietary source code in that software, which could include permitting the use of such software and source code at no cost to the user. Open source license terms are often ambiguous and there is little legal precedent governing the interpretation of these licenses. Successful claims made by the licensors of open source software that we have violated the terms of these licenses could result in unanticipated obligations, including being subject to significant damages, being enjoined from distributing products that incorporate open source software and being required to make available our proprietary source code pursuant to an open source license, which could substantially help our competitors develop products that are similar to or better than ours or otherwise materially and adversely affect our business.

Risks Related to Owning Our Common Stock

The price of our common stock has been, is, and may continue to be, highly volatile, and you may be unable to sell your shares at or above the price you paid to acquire them.

The market price of our common stock is highly volatile, and we expect it to continue to be volatile for the foreseeable future in response to many risk factors listed in this section, and others beyond our control, including:

- actual or anticipated fluctuations in our financial condition and operating results;
- announcements of new products, technological innovations or strategic partnerships by us or our competitors;
- announcements by us, our customers, partners or suppliers relating directly or indirectly to our products, services or technologies;
- overall conditions in our industry and market;
- addition or loss of significant customers;

- changes in laws or regulations applicable to our products;
- actual or anticipated changes in our growth rate relative to our competitors;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures, capital commitments or achievement of significant milestones;
- additions or departures of key personnel;
- competition from existing products or new products that may emerge;
- issuance of new or updated research or reports by securities analysts;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- disputes or other developments related to proprietary rights, including patents, litigation matters or our ability to obtain intellectual property protection for our technologies;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us or our stockholders;
- stock price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- reports, guidance and ratings issued by securities or industry analysts;
- general economic and market conditions; and
- developments related to the Merger.

If any of the forgoing occurs, it would cause our stock price or trading volume to decline. Stock markets in general and the market for companies in our industry in particular have experienced price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations often have been unrelated or disproportionate to the operating performance of those companies. These broad market and industry fluctuations, as well as general economic, political and market conditions such as recessions, interest rate changes or international currency fluctuations, may negatively impact the market price of our common stock. You may not realize any return on your investment in us and may lose some or all of your investment. In the past, companies that have experienced volatility in the market price of their stock have been subject to securities class action litigation. We have been a party to this type of litigation in the past and may be the target of this type of litigation again in the future. Securities litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could seriously harm our business.

Future sales of our common stock could cause our stock price to fall.

We maintain a shelf registration statement on Form S-3 with the SEC pursuant to which we may, from time to time, sell up to an aggregate of $150 million of our common stock, preferred stock, depositary shares, warrants, debt securities or units. We have sold, and plan in the future to sell, shares of our common stock in underwritten offerings and have established, and may in the future establish, "at-the-market" offering programs pursuant to which we may offer and sell shares of our common stock. Sales of securities have resulted and will continue to result in dilution of our existing stockholders, and such sales could cause our stock price to fall.

In addition, if our existing stockholders sell, or indicate an intent to sell, a large number of shares of our common stock in the public market, it could cause our stock price to fall. We may also issue shares of common stock or securities convertible into our common stock from time to time in connection with financings, acquisitions, investments or otherwise. Any such issuance would result in dilution to our existing stockholders and could cause our stock price to fall.

Concentration of ownership by our principal stockholders may result in control by such stockholders of the composition of our board of directors.

Our existing principal stockholders, executive officers, directors and their affiliates beneficially own a significant number of our outstanding shares of common stock. In addition, such parties may acquire additional control by purchasing stock that we issue in connection with our future fundraising efforts. As a result, these stockholders may now and in the future be able to exercise a significant level of control over all matters requiring stockholder approval, including the election of directors. This control could have the effect of delaying or preventing a change of control of our company or changes in management and will make the approval of certain transactions difficult or impossible without the support of these stockholders.

Although we have entered into a definitive agreement to be acquired by Illumina, if the proposed acquisition is not completed, 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, as amended and restated, may have the effect of delaying or preventing a change of control or changes in our management. Our amended and restated certificate of incorporation and bylaws include provisions that:

- authorize our board of directors to issue, without further action by the stockholders, up to 50,000,000 shares of undesignated preferred stock and up to approximately 1,000,000,000 shares of authorized but unissued shares of common 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 terms;
- provide that our directors may be removed only for cause; and
- 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.

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.

Our large number of authorized but unissued shares of common stock may potentially dilute existing stockholders' stockholdings.

We have a significant number of authorized but unissued shares of common stock. Our board of directors may issue shares of common stock from this authorized but unissued pool from time to time without stockholder approval, resulting in the dilution of our existing stockholders.

We do not intend to pay dividends for the foreseeable future.

We have never declared or paid any dividends on our common stock and do not intend to pay any dividends in the foreseeable future. In addition, the terms of our existing debt agreement restrict our ability to pay dividends on our common stock. We anticipate that we will retain all of our future earnings for use in the operation of our business and for general corporate purposes. Any determination to pay dividends in the future will be at the discretion of our board of directors. Accordingly, investors must rely on sales of their common stock after price appreciation, which may never occur, as the only way to realize any future gains on their investments.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

Not applicable.

Item 3. Default Upon Senior Securities

Not applicable.

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

Not applicable.

Item 6. Exhibits

Exhibit Number	Description
31.1	Certification of Chief Executive Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2	Certification of Chief Financial Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1*	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2*	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Labels Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

* The certifications attached as Exhibit 32.1 and 32.2 that accompany this Quarterly Report on Form 10-Q are deemed furnished and not filed with the Securities and Exchange Commission and are not to be incorporated by reference into any filing of Pacific Biosciences of California, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Quarterly Report on Form 10-Q, irrespective of any general incorporation language contained in such filing

Signatures

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

PACIFIC BIOSCIENCES OF CALIFORNIA, INC.

Date: May 3, 2019

By: /s/ SUSAN K. BARNES

Susan K. Barnes
Executive Vice President, Chief Financial Officer and Principal Accounting Officer

Exhibit 31.1

CERTIFICATION OF CHIEF EXECUTIVE OFFICER PURSUANT TO SECURITIES EXCHANGE ACT RULES 13a-15(e), AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Michael Hunkapiller, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Pacific Biosciences of California, Inc.;

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

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

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

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

b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

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

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

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

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

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

Date: May 3, 2019

By: /s/ Michael Hunkapiller
Michael Hunkapiller
Chairman, Chief Executive Officer and President
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF CHIEF FINANCIAL OFFICER PURSUANT TO SECURITIES EXCHANGE ACT RULES 13a-15(e), AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Susan Barnes, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Pacific Biosciences of California, Inc.;

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

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

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

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

b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

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

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

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

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

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

Date: May 3, 2019

By: /s/ Susan K. Barnes

Susan K. Barnes
Executive Vice President, Chief Financial Officer
& Principal Accounting Officer
(Principal Financial Officer)

Exhibit 32.1

Certification of CEO Furnished Pursuant to 18 U.S.C. Section 1350,
As Adopted Pursuant To
Section 906 of The Sarbanes-Oxley Act of 2002

In connection with the Quarterly Report of Pacific Biosciences of California, Inc. (the "Company") on Form 10-Q for the period ended March 31, 2019, as filed with the Securities and Exchange Commission on the date hereof, I, Michael Hunkapiller, Chief Executive Officer of the Company, certify for the purposes of section 1350 of chapter 63 of title 18 of the United States Code, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge,

(i) the Quarterly Report of the Company on Form 10-Q for the period ended March 31, 2019 (the "Report"), fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, and

(ii) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: May 3, 2019

/s/ Michael Hunkapiller

Michael Hunkapiller
Chairman, Chief Executive Officer and President
(Principal Executive Officer)

Exhibit 32.2

Certification of CFO Furnished Pursuant to 18 U.S.C. Section 1350,
As Adopted Pursuant To
Section 906 of The Sarbanes-Oxley Act of 2002

In connection with the Quarterly Report of Pacific Biosciences of California, Inc. (the "Company") on Form 10-Q for the period ended March 31, 2019, as filed with the Securities and Exchange Commission on the date hereof, I, Susan Barnes, Chief Financial Officer of the Company, certify for the purposes of section 1350 of chapter 63 of title 18 of the United States Code, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge,

(i) the Quarterly Report of the Company on Form 10-Q for the period ended March 31, 2019 (the "Report"), fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, and

(ii) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: May 3, 2019

/s/ Susan K. Barnes

Susan K. Barnes
Executive Vice President, Chief Financial Officer &
Principal Accounting Officer
(Principal Financial Officer)