FLUIDIGM CORP
Form 10-K
March 12, 2014
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K
(Mark One)
x ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2013
Or
¨ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to
Commission file number: 001-34180

FLUIDIGM CORPORATION
(Exact name of registrant as specified in its charter)

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

7000 Shoreline Court, Suite 100
South San Francisco, California 94080
(Address of principal executive offices) (Zip Code)
(650) 266-6000
Registrant's telephone number, including area code
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock, $0.001 Par Value per Share	The NASDAQ Global Market

Securities registered pursuant to Section 12(g) of the Act:
None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act of 1933, as amended. Yes x No ¨
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended. Yes ¨ No x
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No ¨
Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes x No ¨
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. x

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

Large accelerated filer	¨	Accelerated filer	x
Non-accelerated filer	¨ (Do not check if a smaller reporting company)	Smaller reporting company	¨

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

As of June 28, 2013, the last business day of the registrant’s most recently completed second fiscal quarter, the aggregate market value of voting and non-voting common equity held by non-affiliates of the registrant was approximately $322,715,572 (based on a closing sale price of $17.46 per share as reported for the NASDAQ Global Market on June 28, 2013). For purposes of this calculation, shares of common stock beneficially owned by the registrant’s officers and directors as of June 28, 2013 and shares of common stock held by persons who held more than 10% of the outstanding common stock of the registrant as of June 28, 2013 (based solely upon Schedule 13G filings made with the SEC) have been excluded from this calculation because such persons may be deemed to be affiliates. This determination of executive officer or affiliate status is not necessarily a conclusive determination for other purposes.

The number of shares of the registrant’s common stock, $0.001 par value per share, outstanding as of February 28, 2014 was 27,873,761.

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DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant’s definitive Proxy Statement relating to its 2014 Annual Meeting of Stockholders are incorporated by reference into Part III of this Form 10-K where indicated

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Special Note Regarding Forward-looking Statements and Industry Data

This Form 10-K contains forward-looking statements that are based on our management's beliefs and assumptions and on information currently available to our management. The forward-looking statements are contained principally in the sections entitled "Business," "Risk factors," and "Management's discussion and analysis of financial condition and results of operations." Forward-looking statements include information concerning our possible or assumed future results of operations, business strategies, financing plans, competitive position, industry environment, potential growth opportunities, and the effects of competition. Forward-looking statements include statements that are not historical facts and can be identified by terms such as "anticipates," "believes," "could," "seeks," "estimates," "expects," "intends," "may," "potential," "predicts, "projects," "should," "will," "would," or similar expressions and the negatives of those terms. Forward-looking statements involve known and unknown risks, uncertainties, and other factors that may cause our actual results, performance, or achievements to be materially different from any future results, performance, or achievements expressed or implied by the forward-looking statements. We discuss these risks in greater detail in the section entitled "Risk factors" and elsewhere in this Form 10-K. Given these uncertainties, you should not place undue reliance on these forward-looking statements.

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

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PART I

ITEM 1. BUSINESS

On February 13, 2014, we completed the acquisition of DVS Sciences, Inc., or DVS, which develops, manufactures, markets, and sells multi-parameter single-cell protein analysis systems. The information set forth under this “Business" section relates principally to our business of manufacturing, marketing, and selling microfluidic systems for single-cell genomics, applied genotyping, and sample preparation for targeted resequencing. For information relating to the acquisition of DVS and DVS's business, please refer to the subsections entitled "Recent Developments—Acquisition of DVS Sciences, Inc." and "—Business of DVS.”

Overview

We develop, manufacture, and market microfluidic systems to academic institutions, clinical laboratories, and pharmaceutical, biotechnology, and agricultural biotechnology (Ag-Bio) companies in growth markets, such as single-cell genomics, applied genotyping, and sample preparation for targeted resequencing. Our proprietary microfluidic systems consist of instruments and consumables, including integrated fluidic circuits (IFCs), assays, and reagents. We actively market four microfluidic systems, including 18 different commercial IFCs, and three families of assay chemistries. Our systems are designed to significantly simplify experimental workflow, increase throughput, and reduce costs, while providing excellent data quality. In addition, our proprietary technology enables genetic analysis that in many instances was previously impractical. As of December 31, 2013, we had sold approximately 920 systems to customers in 35 countries worldwide.

To achieve and exploit advances in life science research, Ag-Bio, pharmaceutical and biotechnology drug development, and clinical research, laboratories need robust systems that deliver high-throughput and simpler workflows at decreased costs. Our microfluidic systems are designed to overcome many of the limitations of conventional laboratory systems by integrating a vast number of fluidic components on a single microfabricated IFC. Our technology enables our customers to perform and measure thousands of sophisticated biochemical reactions on samples smaller than the content of a single cell, while utilizing minute volumes of reagents and samples. Our scalable systems enable rapid preparation of multiple samples in parallel for next-generation DNA sequencing, as well as the isolation, processing, and gene expression profiling of individual cells at low cost.

We have successfully commercialized our BioMark, BioMark HD, and EP1 Systems for genetic analysis; our C_1 Single-Cell Auto Prep System for single-cell sample preparation for targeted gene expression, microRNA analysis, mRNA sequencing, and targeted DNA sequencing; and our Access Array System for sample preparation for targeted next-generation DNA sequencing. Researchers and clinicians have successfully employed our products to help achieve breakthroughs in a variety of fields, including single-cell gene expression, gene regulation, genetic variation, cellular function, and applied genetics. These include using our microfluidic systems to help detect life-threatening mutations in cancer cells, discover cancer associated biomarkers, analyze the genetic composition of individual stem cells, and assess the quality of agricultural products, such as seeds or livestock. We believe our Access Array System resolves a critical workflow bottleneck that exists in all commercial next-generation DNA sequencing platforms and provides fast, simple, low-cost preparation of samples for targeted resequencing. In addition, our C_1 Single-Cell Auto Prep System provides an easy and highly reproducible sample preparation workflow, enabling rapid exploration of unique attributes of individual cells without the technical variability and costs of manual workflows. We expect that the versatility of our microfluidic technology will enable us to develop additional applications across a wide variety of markets.

We have grown our total revenue from $42.9 million in 2011 to $71.2 million in 2013. Our product margin has increased from 67% in 2011 to 71% in 2013. We have incurred significant net losses since our inception, including net losses of $16.5 million in 2013.

Our Target Markets

The current markets for our products include life science research, clinical research, and Ag-Bio.

Life Science Research

Our primary area of focus within life science research is genetic analysis, the study of genes and their functions. The sum total of the hereditary material of an organism is known as its genome, which is commonly organized into

functional units known as genes. Analysis of variations in genomes, genes, and gene activity in and between organisms can provide tremendous insight into their health and functioning. There are several forms of genetic analysis in use today, including gene expression analysis, genotyping, and DNA sequencing.

Gene expression and genotyping are studied through a combination of various technology platforms that characterize gene function and genetic variation. These platforms often rely on polymerase chain reaction, or PCR, amplification to generate

exponential copies of a DNA sample to provide sufficient signal to facilitate detection. Real-time quantitative PCR, or real-time qPCR, is a more advanced form of PCR that makes it possible to identify the number of copies of DNA present in a sample.

The scale of genetic research varies widely. At one end, researchers sometimes examine a limited number of genetic variations in a relatively small population. At the other end, researchers may perform genome-wide association studies where hundreds of thousands of possible genetic variations are examined across thousands or tens of thousands of samples. Researchers are rarely able to discover scientifically relevant information by examining just a few genetic variations because of the inherent complexity of biological systems. In contrast, the result of many genome-wide association studies is simply the identification of a more limited set of genetic variations that need to be examined in a larger population. As a result, some of the most productive life science research is done at a mid-multiplex scale, where tens or hundreds of genetic variations are examined in hundreds or thousands of samples.

We target the following specific areas of life science research, and our products are used for mid-multiplex research or applications of a similar scale:

Gene Expression Analysis and Genotyping. Typically, the process of gene expression involves the generation of ribonucleic acid copies, or RNA copies, of specific regions of the genome by a process known as transcription. Such RNA copies are known as messenger RNAs, or mRNAs. mRNAs may then be translated by the cell into a protein which may affect the activity of the cell or the larger organism. One prevalent form of gene expression analysis measures the levels of mRNA in an individual cell to determine how the activity of particular genes or sets of genes affect the cell or the organism.

Genotyping involves the analysis of DNA variations across individual genomes. There are multiple forms of variants, including single nucleotide polymorphism, or SNPs, insertion-deletions, and copy number variation. A common application of genotyping focuses on analyzing SNPs. In SNP genotyping studies, statistical analyses are performed to determine whether a SNP or group of SNPs are associated with a particular genetic trait, such as propensity for a disease.

Our BioMark HD System performs, among other functions, high-throughput gene expression analysis, including single-cell targeted gene expression analysis, and SNP genotyping, and our EP1 System performs, among other functions, SNP genotyping. Competing technologies, such as pre-formatted arrays, bead arrays, and microarrays, are limited and inflexible because they require nucleic acid sequences on the device to be pre-specified when the chip or other consumable is manufactured. In contrast, our microfluidic systems allow researchers to utilize and easily tailor their assays to meet their experimental needs. We believe our systems also offer meaningful cost savings because they operate on nanoliter volumes of reagents and samples, which represents a small percentage of the amount required by conventional systems.

Single-Cell Genomics. Single-cell genomics is a rapidly emerging area of genetic research that requires specialized tools and techniques to harvest and process individual cells with sufficient sensitivity and reproducibility. Genetic research typically involves the analysis of samples containing thousands of cells and many different cell types. When such samples are studied using traditional gene expression analysis, the results obtained reflect a rough average of the activity of all of the cells in the sample. Recently, researchers have demonstrated that this approach often masks critical differences in gene expression levels between different cell types and even between individual cells of the same type. In addition, in the fields of in-vitro fertilization and stem cell research, researchers are often required to examine single cells because the number of cells available for analysis is inherently limited. The scope of this research has often been constrained because the small amount of genetic material in a single cell prevents conventional methods from analyzing the activity of more than a few genes. Furthermore, large numbers of samples are required to confidently determine the heterogeneous signatures of sub-populations of cells and large research studies like these can be prohibitively expensive or impractical when performed on conventional platforms. Single-cell genomic researchers need to conduct a high number of tests on a large volume of individual cells, which in combination translates into thousands of experiments that must be accurate, fast, simple, and low cost.

The integrated workflow and precision of our systems enable researchers to perform gene expression analysis on single cells on a scale that is impractical with conventional systems due to the cost, experimental variability, and the large amount of biological sample required to initiate the study. We launched our C_1 Single-Cell Auto Prep System in June 2012, which applies our technology to, among other things, rapidly and reliably isolate, process, and profile

individual cells for genomic analysis. Together, our C_1 and BioMark HD Systems improve single-cell targeted gene expression analysis by allowing researchers to extract, reverse transcribe, amplify, and ultimately detect and analyze cell activity using a streamlined workflow, reducing the variability caused by multi-platform technical errors.

The high-throughput of our systems allows researchers to analyze thousands of cells. For example, our BioMark HD System can deliver over 46,000 single cell data points in one day and high-throughput configurations of our system can generate over 110,000 data points per day. Providing the combination of high-throughput and data quality necessary for single-cell targeted gene expression analysis presents significant challenges that we believe most conventional systems are unable to address in a practical manner.

Sample Preparation for Next-Generation DNA Sequencing. Through a process known as nucleic acid sequencing, researchers are able to determine the particular order of nucleotide bases that comprise all or a portion of a particular genome. For example, in the last few years, researchers have begun to use next-generation DNA sequencers to rapidly and cost-effectively sequence portions of genomes and identify genetic variations that correlate with particular characteristics. Next-generation DNA sequencing technologies have dramatically reduced the cost and processing time for genetic sequencing, but to be utilized effectively, require large numbers of unique samples.

Next-generation DNA sequencing requires new sample preparation methodologies, including adding identification tags to each segment of each individual sample that is to be sequenced. These sample preparation and tagging processes, known as target enrichment, are complex and require precise measurement and manipulation of minute quantities of DNA and reagents. Using conventional methods, this preparation and tagging must be done separately for each individual sample being processed, a laborious process that could take several days or more for a typical validation study. The streamlined workflow and flexibility of our Access Array System address this critical workflow bottleneck by allowing samples from up to 48 individuals to be prepared and tagged in approximately four hours.

In addition, researchers are increasingly analyzing the transcriptome at greater depth to uncover new mechanisms of cell development, metabolism, and disease using a technique called mRNA sequencing. Most standard methods for analyzing the transcriptome, such as microarrays and next-generation DNA sequencing, are impractical for single-cell analysis because those technologies require large numbers of cells for analysis and are based on complex workflows that are low-throughput and variable. The mRNA sequencing workflow on our C_1 Single-Cell Auto Prep System was specifically optimized for high-throughput single-cell analysis and provides an easy, end-to-end workflow for sample preparation of up to 96 single cells for downstream detailed transcriptome analysis to rapidly study differential transcriptome profiles of diverse cell populations.

Digital PCR. Digital PCR allows researchers to detect nucleic acid sequences that are present in sample concentrations that are too small to be accurately measured by conventional methods. Digital PCR typically relies on standard PCR techniques, but increases their sensitivity by dividing a sample into hundreds or thousands of smaller samples and then performing a PCR assay on each such sample. The ability to count the presence or absence of amplification in this assay format allows for absolute quantitative measurement capabilities. As a result, digital PCR can perform more precise detection of rare mutations, or copy number measurements, as compared to real-time qPCR.

We were the first to introduce and successfully commercialize a digital PCR system. With our BioMark HD and EP1 Systems, digital PCR has been used for a number of different applications, including absolute quantification, determination of genomic copy number variation, and detection of rare mutations. We were also the first to commercialize a qdPCR system that combines digital and quantitative real-time PCR to provide real-time analysis of digital PCR reactions with high levels of throughput and precision.

Agricultural Biotechnology

Genetic analysis techniques, such as SNP genotyping, genotyping by sequencing, and genotyping by real-time PCR analysis, have become increasingly useful in Ag-Bio applications, including wildlife population studies, agricultural quality control, and commercial genetic engineering and identification. Ag-Bio customers require systems that can quickly and accurately analyze a large number of samples, such as tissue from livestock populations or seeds from a production lot, in a cost-efficient manner. Due to these demands, commercially viable genetic analysis tools in Ag-Bio must be inexpensive, easy to use, and able to provide extremely high-throughput.

The high-throughput, streamlined, and flexible workflow of our systems allows customers to genotype a set of samples in less time and cost than with traditional systems. Our platforms span the breadth of Ag-Bio applications, from low-to-mid SNP genotyping for parentage identification and marker-assisted selection on our EP1 and BioMark HD Systems, to targeted resequencing for novel SNP discovery and validation of our Access Array System.

Clinical Research

Recent advances in genetic analysis technology are increasingly being used for clinical applications. Techniques such as SNP genotyping, gene expression analysis, and other genetic correlation studies are used to identify disease susceptibility and to diagnose, classify, and monitor disease progression. Research relating to molecular diagnostic tests based on measuring these genetic markers have the potential to be much more accurate and robust than conventional diagnostics. Validating these research findings and translating them into clinically available tests often requires life science automation systems that are able to measure multiple biomarkers efficiently in a large number of

patient samples.

Our existing microfluidic systems are able to measure certain nucleic acid biomarkers that are commonly used in these tests, and in the future, we expect to develop additional systems to measure other relevant biomarkers. We believe that the high-throughput, flexibility, and simplified workflow of our microfluidic systems could make them an attractive solution for

validating and commercializing a wide range of molecular diagnostic tests being developed by researchers. Our microfluidic systems have not been cleared or approved by the U.S. Food and Drug Administration, or FDA, for use in any molecular diagnostic tests and we cannot currently market them for the purpose of performing molecular diagnostic tests.

Products

We actively market four microfluidic systems, including 18 different commercial IFCs, as well as three families of assay chemistries. Our systems are based on one or more IFCs designed for particular applications and include specialized reagents, instrumentation, and software. All of our systems include IFC controllers (either stand-alone or embedded) that control the activation of valves and loading of reagents onto the IFC. Each IFC controller comes with software to control IFC and instrument operations for particular applications. We further provide an extensive set of protocols and application notes with all of our systems to support specific scientific applications. All of our systems are designed to be compatible with standard laboratory automation equipment.

Our primary product offerings are summarized in the table below:

Product	Product Description	Applications
Instruments		
BioMark HD System	Real-time PCR instrument, bundled analysis software, and chip loading platforms	SNP Genotyping, Digital PCR and Gene Expression, including Single-Cell Targeted Gene Expression
C_1 Single-Cell Auto Prep System	Sample preparation system for single-cell genomics that facilitates the isolation and processing of individual cells	Single-Cell Targeted Gene Expression, Single-Cell microRNA Analysis, Single-Cell mRNA Sequencing, and Single-Cell Targeted DNA Sequencing (currently available to early access customers)
EP1 System	End-point PCR instrument, bundled analysis software, and chip loading platforms	SNP Genotyping and Digital PCR
Access Array System	Sample preparation system for targeted resequencing that facilitates parallel amplification of up to 48 amplicons across 48 unique samples	Targeted Resequencing with Next-Generation DNA Sequencing
Consumables		
Dynamic Array IFCs		
48.48 Dynamic Array IFC	IFC based on matrix architecture, allowing users to individually assay 48 samples against 48 reagents, generating up to 2,304 real-time qPCR reactions simultaneously	Real-time qPCR, SNP Genotyping and Gene Expression, including Single-Cell Targeted Gene Expression
96.96 Dynamic Array IFC	IFC based on matrix architecture, allowing users to individually assay 96 samples against 96 reagents, generating up to 9,216 real-time qPCR reactions simultaneously	Real-time qPCR, SNP Genotyping and Gene Expression, including

Single-Cell Targeted Gene Expression

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Product	Product Description	Applications
High Precision 96.96 Genotyping IFC	IFC that enables high sample throughput which can deliver more than 36,000 data points in a day with a minimum call rate of 99.9%, a level of precision that is vital to production and human genomics laboratories	SNP Genotyping
192.24 Dynamic Array IFC for Genotyping	IFC that allows users to genotype 192 samples against 24 assays in a single run, generating up to 4,608 parallel reactions	SNP Genotyping
192.24 Dynamic Array IFC for Gene Expression	IFC that enables high sample throughput of 576 samples across 24 genes in an 8-hour day	Gene Expression
FLEXsix Gene Expression IFC	IFC that utilizes a new architecture which incorporates six 12 X 12 partitions that can be organized in any configuration, in up to six separate experimental runs	Gene Expression
Digital Array IFCs		
12.765 Digital Array IFC	IFC based on partitioning architecture, allowing users to divide samples into up to 765 chambers in each of the 12 panels for up to 9,180 reactions per IFC	Digital PCR, Copy Number Variation and Mutation Detection
48.770 Digital Array IFC	IFC based on partitioning architecture, allowing users to divide samples into up to 770 chambers in each of the 48 panels for up to 36,960 reactions per IFC	Digital PCR, Copy Number Variation and Mutation Detection
qdPCR 37K IFCs	IFC that combines digital and quantitative real-time PCR to provide real-time analysis of up to 36,960 digital PCR reactions per IFC with high-throughput and precision, performing at a 99.9% success rate, which is critical in high-sensitivity applications, such as rare mutation detection, GMO testing, and aneuploidy detection	Digital PCR, Copy Number Variation and Mutation Detection
C_1 Single-Cell Auto Prep Array IFCs	IFC that captures and prepares individuals cells for genomic analysis, and uses integrated thermal and pneumatic controls at nanoliter scale to enable the performance of all steps of the single-cell genomic workflow without intervention; designed to maximize cell capture efficiency based on cell size (5-25 micron); available in three sizes per application	Sample Preparation for Single-Cell Targeted Gene Expression, Single-Cell microRNA Analysis, Single-Cell mRNA Sequencing, and Single-Cell Targeted DNA Sequencing (currently available to early access customers)
Access Array IFCs	IFC that facilitates parallel amplification, barcoding, and tagging of 48 unique samples	Targeted Resequencing with Next-Generation

	and is designed to enable recovery of reaction products from the IFC for sequencing	DNA Sequencing
DELTAgene and SNPtype Assays	Custom designed assays for specific nucleic acid regions of interest, providing optimized assays, content, and services to users of BioMark Systems at lower costs as compared to other commercially available chemistries	Gene Expression, Single-Cell Targeted Gene Expression, and SNP Genotyping
Access Array Target-Specific Primers	Allows for fast, simple and inexpensive preparation of up to 480 amplicons per sample at a time	Targeted Resequencing with Next-Generation DNA Sequencing

The BioMark HD System

Our BioMark HD System performs high-throughput gene expression analysis, single-cell targeted gene expression analysis, SNP genotyping, and digital PCR using Fluidigm DELTAgene and SNPtype assays, other chemistries, and Fluidigm Dynamic Array and Digital Array IFCs.

The BioMark HD System includes real-time PCR device components that comprise a fast thermal cycler for PCR and a fluorescence reader that can detect the results of reactions over time. Our IFC controllers for the BioMark HD System fully automate the setup of Dynamic Array and Digital Array IFCs for real-time qPCR-based experiments and include software for implementing and tracking experiments. Our BioMark HD reader controls the PCR process and detects the fluorescent signals generated using a white light source, emission and excitation filters, precision lenses, a fast thermal cycler and a digital camera. We also offer various software packages that provide data analysis, annotation, and archival following data collection. Our analysis software shows data as a color-coded map of every position on the IFC, such as for amplification curves, and as numeric tabular data.

The C_1 Single-Cell Auto Prep System

Our C_1 Single-Cell Auto Prep System enables rapid and reliable isolation, processing, and profiling of individual cells for genomic analysis for key applications, such as single-cell targeted gene expression, single-cell microRNA analysis, single-cell mRNA analysis, and single-cell targeted DNA sequencing, using our C_1 Single-Cell Auto Prep Array IFCs and C_1 reagent kit. Our C_1 Single-Cell Auto Prep System includes software that features pipetting templates, predefined and validated methods, and our SINGuLAR Data Analysis Toolset to view and interpret single-cell genomic data. Coupled with the BioMark HD System, the C_1 Single-Cell Auto Prep System streamlines genomic analysis to support up to 96 individual cells across 96 transcripts for candidate gene studies or quality control of complementary DNA, or cDNA, libraries prior to mRNA sequencing.

The EP1 System

The EP1 System performs SNP genotyping using Fluidigm SNPtype assays or TagMan assays, and end-point digital PCR using TaqMan assays, and Fluidigm Dynamic Array and Digital Array IFCs. Because of its high-throughput and focus on SNP genotyping, the EP1 System is a preferred choice by our Ag-Bio customers for field implementation. The IFC controllers for the EP1 System fully automate the setup of IFCs for end-point SNP genotyping and digital PCR experiments, and include software for implementing and tracking experiments. Our EP1 reader detects fluorescent signals generated in our IFCs using a light source, emission and excitation filters, precision lenses, and a digital camera. Our FC1 cycler performs fast thermal cycling for IFCs and enables up to 12 Dynamic Array IFCs to be run per day. We also offer various software packages that provide data analysis, annotation, and archival following data collection. Our analysis software shows data as color-coded map of every position on the chip, cluster maps showing results for every assay, and as numeric tabular data.

The Access Array System

The Access Array System is used with the Access Array IFC to enable automated PCR-based target enrichment, barcoding, and tagging of targeted resequencing libraries, at a cost of $10 per sample or less. The Access Array System can be used in conjunction with our BioMark HD System to provide real-time monitoring of amplification steps.

The Access Array System is comprised of two IFC controllers and a single stand-alone thermal cycler. This system can load Access Array IFCs, amplify and tag the regions of interest, and recover the sample for loading into a next-generation DNA sequencer. We provide optimized barcoding primers, or Access Array Barcode Libraries, for use with Roche, Life Technologies Corporation (now part of Thermo Fisher Scientific), and Illumina sequencing platforms. When used with the Access Array IFC, the barcode library enables the user to pool products of different samples, perform amplification of all samples in parallel, and then sequence the pooled samples as a single sample. We also offer the D3 Assay Design Service to provide validated custom primer sets for users.

Technology

Our products are based on a tiered set of related proprietary technologies that we have either developed internally or licensed from third parties.

Multi-Layer Soft Lithography

Our IFCs are manufactured using a technology known as multi-layer soft lithography, or MSL technology. Using MSL technology, we are able to create valves, chambers, channels, and other fluidic components on our IFCs at high

density. We combine these components in complex arrangements that allow nanoliter quantities of fluids or drops to be precisely

manipulated within the IFC. Unlike most prior microfluidic technologies, our IFCs do not rely on electricity, magnetism, or similar approaches to control fluid movement. Rather, they control fluid flow with valves. The most important components on our IFCs are our NanoFlex valves, which are created by the intersection of two channels on adjacent layers. When the valve is open, fluid is able to flow through the lower or "flow" channel. When the upper or "control" channel is pressurized, the material separating the two channels is deflected into the lower channel, closing the valve and stopping fluid flow. If pressure is removed from the control channel, the channels return to their original form, and the valve is again open. The elastomeric properties of microfluidic IFC cores allow our NanoFlex valves to form a reliable seal and cycle through millions of openings and closings.

The elastomer we currently use for our commercial products is a form of silicone rubber known as polydimethylsiloxane, or PDMS, but we have researched other materials with different properties for specific purposes. PDMS is transparent, which allows the fluids and their contents to be easily monitored with a variety of existing optical technologies, such as bright field, phase contrast, or fluorescence microscopy. The gas permeability of PDMS allows the reliable metering of fluids with near picoliter precision by eliminating the bubble problems encountered by most other microfluidic technologies. In essence, we are able to pump fluids into closed reaction chambers at sufficient pressure to drive any air out of the chamber directly through the chamber walls. This gas permeability also supports maintenance of cells in cell culture conditions. PDMS offers a favorable environment for many biochemical reactions, including PCR and cell culture.

We have developed commercial manufacturing processes to fabricate valves, channels, vias, and chambers with dimensions in the ten to 100 micron range, at high density and with high yields. For research purposes, we have created devices with both substantially smaller and larger features. Although our manufacturing is based on standard semiconductor manufacturing technologies and techniques, we have also developed novel processes for mold fabrication that enable mass production of high density IFCs with nanoliter volume features. These processes are sufficiently robust such that new microfluidic designs can often be built using existing fabrication techniques, allowing for rapid innovation of new IFC designs without needing manufacturing process or equipment changes.

Integrated Fluidic Circuits

Our IFCs incorporate several different types of technology that together enable us to use MSL technology to rapidly design and deploy new microfluidic applications.

Microfluidic Components. The first level of our IFC technology is a library of components that perform basic microfluidic functions. We have proven designs for numerous elements, such as pumps, mixers, separation columns, control logic, and reaction chambers. These are readily integrated to create circuits capable of performing a wide range of biochemical reactions. Even when it is necessary to integrate multiple elements to perform a particularly complex reaction, the area taken up on a circuit for a single reaction is small compared to our typical overall IFC core size of three centimeters by three centimeters. As a result, we are routinely able to develop IFCs that perform thousands of reactions per square centimeter.

Architectures. The second level of our IFC technology comprises the architectures we have designed to exploit our ability to conduct thousands of reactions on a single IFC. The first of these is the Dynamic Array IFC, a matrix architecture that allows multiple different samples and multiple different reagents to be loaded onto a single IFC and then combined so that there is an isolated reaction between each sample and each reagent. The primary advantage of this architecture is that each sample and reagent is only handled by a pipette once per IFC rather than once per reaction, as is the case with conventional technologies. For example, a single 96.96 Dynamic Array IFC can perform a total of 9,216 unique reactions between 96 samples and 96 reagents with only 192 pipetting steps, compared to approximately 18,432 pipetting steps with conventional technologies. In addition, the configuration of the IFC can be changed. For instance, our 192.24 Dynamic Array IFC for genotyping allows reactions between 192 samples and 24 assays. Our targeted next-generation DNA sequencing sample preparation architecture allows us to bring similar benefits to reactions which require export of the reaction product and more complex (multi-step) reactions. For example, our Access Array IFC amplifies 48 genetic regions on each of 48 samples and exports each prepared sample. Our Digital Array IFC architecture allows a sample to be split into hundreds to hundreds of thousands of sub-samples. Separate reactions can then be conducted on each of the smaller sub-samples. Our cell processor architecture automates cell seeding, culture, combinatorial dosing with multiple reagents, and export for further analysis. For example, our C_1 Single-Cell Auto Prep Array IFC enables the capture of many single cells from a flow stream, as well

as the execution of molecular biology protocols on each individual cell in parallel.

Interface and Handling Carriers. The third level of our IFC technology involves the interaction of our IFCs with the actual laboratory environment. Our IFCs are built on specially designed input frames that are compatible with most commonly used laboratory systems, including existing robotic pipetting systems, bar code readers, plate handling systems, and other equipment. The core elastomeric block at the center of our IFC is surrounded by the frame, that delivers samples and reagents to the blocks. The frames, or carriers, also transmit the pressure and control signals from our instruments to the IFC.

Technological Advances. In our research and development laboratory, we have built and tested fully functional Digital Array IFCs capable of performing 200,000 assays, over five-fold more than our 48.770 Digital Array IFC. We also designed an IFC architecture and built a system to automate laboratory protocols that require one or more column chromatography steps. The IFC can generate high quality sequencing libraries for bacterial and human DNA samples using a commercially available sequencing library preparation kit.

Instrumentation and Software

We have developed instrumentation technology to load samples and reagents onto our IFCs and to control and monitor reactions within our IFCs. Our line of IFC controllers consists of commercial pneumatic components and both custom and commercial electronics. They apply precise control of multiple pressures to move fluid and control valve states in a microfluidic IFC. Our BioMark HD System consists of a custom fast thermal cycler packaged with a sophisticated fluorescence imaging system. Our FC1 cycler is a custom thermal cycler capable of very rapid cycling: 45 cycles in 30 minutes. Our EP1 instrument is a fluorescence reader designed for end-point imaging, suitable for genotyping and digital PCR applications. All of these instruments are designed to be easily introduced into standard automated lab environments.

We have developed specialized software to manage and analyze the unusually large amounts of data produced by our systems. Our BioMark HD System's gene expression analysis software automatically measures individual real-time qPCR reactions from fluorescent images and generates amplification threshold crossing values, allowing researchers to readily perform complete normalized comparative gene expression analysis across large numbers of samples and assays. Similarly, our SNP genotyping analysis software automatically clusters fluorescent intensities from individual genotype reactions and makes genotype calls across individual and multiple IFC runs. Our digital PCR analysis software automatically calculates absolute copy number and copy number ratios from digital PCR experiments. Our melting curve analysis software supports genotyping from data collected on the BioMark HD System. More recently, we developed bioinformatic tools for single-cell genomics for our C_1 Single-Cell Auto Prep and BioMark HD Systems, the SINGuLAR Analysis Toolset, to facilitate the analysis and visualization of single-cell gene expression data.

Assays Design and Protocols

Our DELTAgene and SNPtype assay products consist of assay design and custom content delivery systems for gene expression and genotyping, respectively. We believe our assay design and content delivery systems represent an improvement over conventional pre-defined panels by allowing customization based on cellular pathways or biological areas of interest while lowering up-front costs of experiments. These offerings provide low-cost alternatives to chemistries such as TaqMan, and allow customers to use IFCs in more flexible ways. By specifying genes or SNP sites of interest and matching them to region specific primers, customers using our existing systems are able to amplify specific genetic regions of interest at reduced cost without sacrificing data quality.

PCR assay reagents need to be specific to the gene targets of interest. Since our systems analyze many gene targets at once, the process of designing a set of assays may delay the implementation experiments or require the use of expensive pre-designed assays. To address this issue, we developed a computational method for rapid-turn PCR assay design. This process allows us to provide customers with validated assays for their targets of interest. We have commercialized this service for our BioMark HD, EP1, and Access Array System customers through our DELTAgene and SNPtype assays and our Access Array Target-Specific primers.

We also provide protocols to guide our customers in the use of our products with commonly available molecular biology reagents for the analysis of their specific sample types.

Sales and Marketing

We distribute our microfluidic systems through our direct sales force and support organizations located in North America, Europe, and Asia-Pacific, and through distributors or sales agents in several European, Latin American, Middle Eastern, and Asia-Pacific countries. Our domestic and international sales force informs our current and potential customers of current product offerings, new product introductions, technological advances in our microfluidic systems and workflows, and notable research being performed by our customers or ourselves. As our primary point of contact in the marketplace, our sales force focuses on delivering a consistent marketing message and high level of customer service, while also attempting to help us better understand our customers' needs. As of December 31, 2013, we had 97 people employed in sales, sales and technical support, and marketing, including 50

sales representatives and technical pre-sales specialists located in the field. We intend to significantly expand our sales, support, and marketing efforts in the future.

Our sales and marketing efforts are targeted at laboratory directors and principal investigators at leading companies and institutions who need reliable life science automation solutions for their business or commercial purposes. We seek to increase awareness of our products among our target customers through regular contact, participation in tradeshows, customer site

seminars, academic conferences, and dedicated company gatherings attended by prominent users and prospective customers from various institutions.

Our systems are relatively new to the market place and require a capital investment. As a result, our sales process often involves numerous interactions and demonstrations with multiple people within an organization. Some potential customers conduct in-depth evaluations of the system including running experiments on our system and competing systems. In addition, in most countries, sales to academic or governmental institutions require participation in a tender process involving preparation of extensive documentation and a lengthy review process. As a result of these factors and the budget cycles of our customers, our sales cycle, the time from initial contact with a customer to our receipt of a purchase order, can often be 12 months or longer.

Single-Cell Genomics Collaborations

In May 2012, in collaboration with the Broad Institute, we announced the launch of the Single-Cell Genomics initiative, or SCGi, a new research center dedicated to accelerating the development of research methods and discoveries in mammalian single-cell genomics. The SCGi facilitates collaborative development by single-cell genomics researchers of novel single-cell, microfluidic approaches for gene expression profiling, RNA/DNA sequencing, and epigenetic analysis, and to develop and disseminate new application workflows, reagents, bioinformatics tools, and data sets to the greater scientific community. The SCGi is located at the Broad Institute in Cambridge, Massachusetts, and features a complete suite of our single-cell tools, protocols, and technologies, most notably the BioMark HD System.

In December 2012, in collaboration with the Genome Institute of Singapore, or GIS, an institute under the umbrella of the Agency for Science, Technology and Research, we announced the establishment of the Single-Cell ‘Omics Center, or SCOC, the first research center in Asia exclusively dedicated to accelerating the understanding of how individual cells work, and how diagnosis and treatment might be enhanced through insight derived from single cells. The SCOC provides integrated analytics for single-cell genomic applications to the region’s single-cell genomics researchers. The SCOC is located in dedicated laboratory space at GIS facilities in Biopolis, Singapore, and features the full capabilities of our C_1 Single-Cell Auto Prep and BioMark HD Systems for single-cell targeted gene expression analytics and validation.

Customers

We have sold our C_1 Single-Cell Auto Prep, BioMark, BioMark HD, EP1, and Access Array Systems to leading academic institutions, clinical laboratories, and pharmaceutical, biotechnology and Ag-Bio companies. As of December 31, 2013, we had sold approximately 920 systems to customers in 35 countries. No single customer represented more than 10% of our total revenue for 2013, 2012, or 2011.

Manufacturing

Our microfluidic systems and instrumentation for commercial sale, as well as for internal research and development purposes, are manufactured at our facilities in Singapore. We also manufacture IFCs for research and development and our assay chemistries at our headquarters in South San Francisco, California.

We established our primary manufacturing facility in Singapore to take advantage of the skilled workforce, supplier and partner network, lower operating costs, and government support available there. Our microfluidic system manufacturing process includes photolithography and fabrication technologies that are very similar to those used in the fabrication of semiconductor chips. As a result, we are able to hire from a pool of skilled manpower created by the existing semiconductor industry in Singapore. Similarly, the Singapore semiconductor industry has created a broad network of potential suppliers and partners for our manufacturing operations. We are able to locally source a large proportion of the raw materials required in our processes and have been able to collaborate with local engineering companies to develop enabling technologies chip fabrication.

Our manufacturing operations in Singapore have been supported by grants from the Singapore Economic Development Board, or EDB, which provides incentive grant payments for research, development and manufacturing activity in Singapore. Our arrangements with EDB require us to maintain manufacturing and research and development presence in Singapore.

The leases for our current manufacturing facility in Singapore will terminate on September 30, 2014. On October 14, 2013, Fluidigm Singapore Pte. Ltd., or Fluidigm Singapore, our wholly-owned subsidiary, accepted an offer of tenancy relating to the lease of a new manufacturing facility in Singapore, which expires on June 1, 2022. We expect

to consolidate our manufacturing operations in the new space in the third quarter of 2014. We expect that our existing manufacturing capacity, and anticipated manufacturing capacity under the new lease, for instrumentation and IFCs is sufficient to meet our needs at least through 2016 and, with anticipated modifications for additional capacity, through 2018.

We rely on a limited number of suppliers for certain components and materials used in our products. While we are in the process of qualifying additional sources of supply, we cannot predict how long that qualification process will last. If we were to lose one or more of our limited source suppliers, it would take significant time and effort to qualify alternative suppliers. Key components in our products that are supplied by sole or limited source suppliers include a specialized polymer and other specialized materials from which our IFC cores are fabricated, specialized custom camera lenses, fiber light guides, and other components required for the reader of our BioMark System, specialized pneumatic and electronic components for our C_1 Single-Cell Auto Prep System, and certain raw materials for our DELTAgene and SNPtype assays and Access Array Target-Specific primers. With respect to many of our suppliers, we are neither a major customer, nor do we have long term supply contracts. These suppliers may therefore give other customers' needs higher priority than ours, and we may not be able to obtain adequate supply in a timely manner or on commercially reasonable terms.

Research and Development

We have assembled experienced research and development teams at our South San Francisco, California, and Singapore locations with the scientific, engineering, software, bioinformatic, and process talent that we believe is required to grow our business.

New Product and Application Development

The largest component of our current research and development effort is in the areas of new products and new applications.

Cell Culture System. With the support of a grant from the California Institute of Regenerative Medicine, or CIRM, in an aggregate amount of $750,000, we have developed a prototype microfluidic cell culture system that enables researchers to independently control the conditions for multiple cell cultures, allowing sequential dosing of a variety of factors and then extraction of the cells for further analysis. In 2011, CIRM awarded us with an additional $1.9 million grant over three years to further advance research in this area and to deliver useable prototypes to a limited number of stem cell research laboratories.

Assay and Reagent Development. We intend to enhance our SNPtype genotyping assays, DELTAgene gene expression assays, and Access Array Target-Specific primer sets with improved performance and features. For genotyping, we plan to improve our SNPtype bioinformatic pipelines to support additional types of mutations, improve assay design rates for difficult areas of the genome, and offer it in additional formats. For gene expression, we intend to lower sample preparation reagents with lower costs and to increase the multiplexing to enable analysis of larger sets of genes. We currently support most major third party commercial sequencing platforms, and we plan to provide reagents necessary to support Access Array Target-Specific primer sets for new major platforms as they are developed. In 2013, we introduced the D3 Assay Design Service to provide customers with automated submission and feedback tools to improve the design assay design experience.

Integrated Fluidic Circuit and Instrument Architectures. We intend to develop additional products to strengthen the capabilities of our existing Dynamic Array, Access Array, and C_1 Single-Cell Auto Prep Array IFC product families. We intend to design IFC architectures that are more flexible and cost effective for researchers with smaller numbers of assays or smaller numbers of samples. We plan to evaluate next-generation instrument architectures supporting these new IFC formats with analytical capability and other features. We are developing additional IFCs for use with our C_1 Single-Cell Auto Prep System that are expected to capture a larger numbers of cells and further integrate traditional cell biology methods with modern genomic analysis.

Single-Cell Genomics Applications. In late 2012, we launched our mRNA sequencing workflow, which is specifically optimized for high-throughput single-cell analysis and enables larger scale, transcriptome-wide studies. In late 2013, we announced our universal sample preparation workflow for single-cell DNA sequencing that runs on our C_1 Single-Cell Auto Prep System, which is currently available to early access customers. We also introduced our SINGuLAR Analysis Toolset for analyzing and visualizing single-cell gene expression data in 2013.

We intend to expand the menu of single-cell applications available on our C_1 Single-Cell Auto Prep System to include additional RNA and DNA analysis methods and a new protein analysis protocol. We are also developing gene expression reference data sets of individual cells from diverse cell populations, which we intend to make available to the broader scientific community and use to support new user training, develop new analysis tools, and assist in the establishment of applicable quality standards.

Process Development

The second component of our research and development effort is process development. We continuously develop new manufacturing processes and test methods to drive down manufacturing cost, increase manufacturing throughput, widen fabrication process capability, and support new microfluidic devices and designs. Our prototype fabrication facility at our

Singapore manufacturer fabricates prototype IFCs working closely with product development teams in South San Francisco, California. This process development team's focus is to improve fabrication processes for the production line. We invest in manufacturing automation, process changes, and design modifications which historically have significantly improved yields and lowered the manufacturing costs of our IFCs.

Our research and development expenses were $20.0 million, $16.6 million, and $13.9 million in 2013, 2012, and 2011, respectively. As of December 31, 2013, 71 of our employees were engaged in research and development activities.

Competition

We compete with both established and development stage life science companies that design, manufacture, and market instruments for gene expression analysis, genotyping, other nucleic acid detection, and additional applications. For example, companies such as Affymetrix, Inc., Agilent Technologies, Inc., Bio-Rad Laboratories, Inc., Illumina, Inc., Life Technologies Corporation (now part of Thermo Fisher Scientific), LGC Limited, Luminex Corporation, NanoString Technologies, Inc., PerkinElmer, Inc. (through its acquisition of Caliper Life Sciences, Inc.), RainDance Technologies, Inc., Roche Applied Science (a division of Roche Diagnostics Corporation), Sequenom, Inc., Thermo Fisher Scientific Inc., and WaferGen Bio-Systems, Inc. have products that compete in certain segments of the market in which we sell our products. In addition, a number of other companies and academic groups are in the process of developing novel technologies for life science markets.

The life science automation industry is highly competitive and expected to grow more competitive with the increasing knowledge gained from ongoing research and development. Many of our competitors are either publicly traded or are divisions of publicly traded companies and enjoy several competitive advantages over us, including:

- significantly greater name recognition;
- greater financial and human resources;
- broader product lines and product packages;
- larger sales forces and eCommerce channels;
- larger and more geographically dispersed customer support organization;
- substantial intellectual property portfolios;
- larger and more established customer bases and relationships;
- greater resources dedicated to marketing efforts;
- better established and larger scale manufacturing capability; and
- greater resources and longer experience in research and development.

We believe that the principal competitive factors in our target markets include:

- cost of capital equipment and supplies;
- reputation among customers;
- innovation in product offerings;
- flexibility and ease of use;
- accuracy and reproducibility of results; and
- compatibility with existing laboratory processes, tools, and methods.

To successfully compete with existing products and future technologies, we need to demonstrate to potential customers that the cost savings and performance of our technologies and products, as well as our customer support capabilities, are superior to those of our competitors. The regular introduction of new and innovative offerings is necessary to continue to differentiate our company from other, larger enterprises. Additionally, a well staffed commercial team "in the field" is required to successfully communicate the advantages of our products and overcome potential obstacles to acceptance of our products. In addition, ongoing collaborations and partnerships with key opinion leaders in the genetics fields are desirable to demonstrate both innovation and applicability of our products. These relationships create the need for retention of a large and talented specialized staff, and occasionally require the placement of products or supplies on a temporary basis at a customer facility to demonstrate applicability of our tool to a specific scientific application.

Intellectual Property

Strategy and Position

Our core technology originated at the California Institute of Technology, or Caltech, in the laboratory of Professor Stephen Quake, who is a co-founder of Fluidigm. Dr. Quake, his students, and their collaborators pioneered the application of MSL technology in the field of microfluidics. In particular, Dr. Quake's laboratory developed technologies that enabled the

production of specialized valves and pumps capable of controlling fluid flow at nanoliter volumes. In a series of transactions, we exclusively licensed from Caltech the relevant patent filings relating to these developments. We have also entered into additional exclusive and non-exclusive licenses for related technologies from various companies and academic institutions.

Our patent strategy is to seek broad patent protection on new developments in microfluidic technology and then later file patent applications covering new implementations of the technology and new microfluidic circuit architectures utilizing the technology. As these technologies are implemented and tested, we file new patent applications covering scientific methodology enabled by our technology. Additionally, where appropriate, we file new patent applications covering instrumentation and software that are used in conjunction with our microfluidic systems.

We have developed our own portfolio of issued patents and patent applications directed to commercial products and technologies in development. Our portfolio covers methods and devices for isolating, culturing, and analyzing single cells; technologies for processing and preparing DNA samples for next-generation DNA sequencing; high-density and reusable IFCs for performing genotyping and measuring gene expression with massive multiplexing, and techniques for using these IFCs; and associated instrumentation and software for controlling and reading our IFCs and analyzing the data obtained from them.

As of December 30, 2013, we owned or licensed over 300 patents and we had approximately 200 pending patent applications worldwide. Our patents have expiration dates ranging from 2018 to 2031. The U.S. issued patents we have licensed from Caltech expire between 2017 and 2030.

The patent positions of companies like ours are generally uncertain and involve complex legal and factual questions. Our patents may not enable us to obtain or keep any competitive advantage. Our pending U.S. and foreign patent applications may not issue as patents or may not issue in a form that will be advantageous to us. Any patents we have obtained or do obtain may be challenged by re-examination, opposition, or other administrative proceeding, or may be challenged in litigation, and such challenges could result in a determination that the patent is invalid. In addition, competitors may be able to design alternative methods or devices that avoid infringement of our patents. To the extent our intellectual property protection offers inadequate protection, or is found to be invalid, we are exposed to a greater risk of direct competition. If our intellectual property does not provide adequate protection against our competitors' products, our competitive position could be adversely affected, as could our business. Both the patent application process and the process of managing patent disputes can be time consuming and expensive. Furthermore, the laws of some foreign countries may not protect our intellectual property rights to the same extent as do the laws of the United States.

In addition to pursuing patents on our technology, we have taken steps to protect our intellectual property and proprietary technology by entering into confidentiality agreements and intellectual property assignment agreements with our employees, consultants, corporate partners, and, when needed, our advisors. Such agreements may not be enforceable or may not provide meaningful protection for our trade secrets or other proprietary information in the event of unauthorized use or disclosure or other breaches of the agreements, and we may not be able to prevent such unauthorized disclosure. Monitoring unauthorized disclosure is difficult, and we do not know whether the steps we have taken to prevent such disclosure are, or will be, adequate.

Our commercial success may depend in part on our non-infringement of the patents or proprietary rights of third parties. Third parties have asserted and may assert in the future that we are employing their proprietary technology without authorization. Competitors may assert that our products infringe their intellectual property rights as part of a business strategy to impede our successful entry into those markets. In addition, our competitors and others may have patents or may in the future obtain patents and claim that use of our products infringes these patents. We could incur substantial costs and divert the attention of our management and technical personnel in defending against any of these claims. Parties making claims against us may be able to obtain injunctive or other relief, which could block our ability to develop, commercialize, and sell products, and could result in the award of substantial damages against us. In the event of a successful claim of infringement against us, we may be required to pay damages and obtain one or more licenses from third parties, or be prohibited from selling certain products. We may not be able to obtain these licenses at a reasonable cost, if at all.

License Agreements

We have entered into several significant exclusive, co-exclusive, and non-exclusive licenses to patents and patent applications owned by various academic institutions, and have additional intellectual property agreements with a range of institutions and companies.

Our license agreement with Caltech provides us with an exclusive, worldwide license to certain patents and related intellectual property, as well as the right to prosecute licensed patent filings worldwide at our expense and to initiate any infringement proceedings. Caltech retains the right to use the licensed materials for noncommercial educational and research purposes, as well as any rights necessary to comply with the statutory rights of the U.S. government. We have issued shares of our common stock to Caltech and we agreed to pay to Caltech royalties based on sales revenue of licensed products on a

country-by-country basis with a minimum annual royalty. The license agreement will terminate as to each country and licensed product upon expiration of the last-to-expire patent covering licensed products in each country.

Our license agreements with Harvard University allow sublicenses (i) provided we can demonstrate that we have added significant value to the patent rights to be sublicensed and that such sublicense also contains a substantial and essentially simultaneous license to intellectual property owned by us, or (ii) when such patent rights are necessary to practice other Harvard University patent rights exclusively licensed to us which are also being licensed. We have issued shares of our common stock to Harvard and we agreed to pay to Harvard royalties based on sales revenue of licensed products on a country-by-country basis with a minimum annual royalty. Harvard is responsible for filing and maintaining all licensed patents, but we must reimburse Harvard for our share of its related patent prosecution expenses. We have the right to prosecute any infringement of our licensed patent rights. The license agreement will terminate with the last-to-expire of the licensed patents.

On June 30, 2011, we settled certain litigation and entered into a series of patent cross-license and sub-license agreements with Life Technologies Corporation (now part of Thermo Fisher Scientific) and its Applied Biosystems, LLC subsidiary, referred to as Life, relating to various patent rights of the two companies. Specifically, the agreements involve a cross-license concerning our imaging readers and other patent filings and certain of Life's patent families relating to methods and instruments for conducting nucleic acid amplification, such as with PCR; a sub-license that provides us access to certain of Life's digital PCR patents; and a sublicense that provides Life access to certain of our non-core technology patents licensed from Caltech. The agreements provide for various royalty payments by each of the parties, including a royalty on certain Life instruments. In July 2011, pursuant to the terms of the agreements, we paid Life $2.0 million in connection with our exercise of an option to preclude Life from initiating litigation under its patents existing as of June 30, 2011 against our customer's for two years and against our company, with respect to our current products and equivalent future products, for four years, subject to certain exceptions. Pursuant to the terms of a patent cross license agreement, we are obligated to make a $1.0 million payment to Life upon satisfaction of certain conditions. We do not believe that the conditions triggering the payment obligation have been met; however, on October 16, 2013, Life provided notice that the $1.0 million payment was due and payable under the license agreement. We accrued a loss contingency of $1.0 million on September 30, 2013 and on January 30, 2014, we paid Life the amount due while reserving our rights with respect to such matter. Among other reasons, we made the payment to avoid what would have been, in our view, an improper termination of our license to certain Life patent filings under the agreement, which could have subjected our relevant product lines to risks associated with patent infringement litigation.

In May 2011, we entered into a license agreement with Caliper Life Sciences, Inc., which subsequently became a PerkinElmer company, referred to as Caliper, to license Caliper's existing patent portfolio in certain fields, including non-invasive prenatal diagnostics, and obtained an option to extend the license to cover additional fields. Under the agreement, we made an up-front payment of $0.6 million, which is subject to adjustment, and will have royalty obligations commencing in January 2012. In August 2011, we entered into an amendment to the agreement with Caliper and made an additional up-front payment of $0.5 million. Pursuant to the amendment, the rates for royalties payable to Caliper were substantially reduced and the period for which we are obligated to make royalty payments was shortened, with the last payment due in mid-2018 for our existing products at the time of amendment and their future equivalents. If any of our future products are determined to infringe Caliper's patents, the same reduced royalty rates will apply until the respective patents expire.

Government Regulation

Pursuant to its authority under the Federal Food, Drug and Cosmetic Act, or FFDCA, the FDA has jurisdiction over medical devices, which are defined to include, among other things, in vitro diagnostic products, or IVDs used for clinical purposes. Our products are currently labeled and sold for research purposes only, and we sell them to academic institutions, life sciences and clinical laboratories that conduct research, and pharmaceutical and biotechnology companies for non-diagnostic purposes. Our products are not intended for use in clinical practice in the diagnosis of disease or other conditions, and they are labeled for research use only. Accordingly, they are subject only to limited, specific regulation with respect to labeling as IVD medical devices by the FDA. In particular, while FDA regulations require that research use only products be labeled, "For Research Use Only. Not for use in diagnostic procedures," or RUO products, the regulations do not subject such products to the FDA's broader pre- and post-market

controls for medical devices. In November 2013, the FDA issued a final guidance document intended to clarify the types of in vitro diagnostic products that are properly labeled “for research use only.” The guidance states that merely including a labeling statement that the product is for research purposes only will not necessarily render the device exempt from the FDA’s clearance, approval, or other regulatory requirements if the circumstances surrounding the distribution of the product indicate that the manufacturer knows its product is being used by customers for diagnostic uses. These circumstances may include, among other things, written or verbal marketing claims regarding a product’s performance in clinical applications and a manufacturer’s provision of technical support for such activities. In the future, certain of our products or related applications could become subject to regulation as medical devices by the FDA.

For example, if we wish to label and market our products for use in performing clinical diagnostics, thus subjecting them to regulation by the FDA under premarket and postmarket control as medical devices, unless an exemption applies, we would be required to obtain either prior 510(k) clearance or prior pre-market approval from the FDA before commercializing the product. The FDA classifies medical devices into one of three classes. Devices deemed to pose lower risk to the patient are placed in either class I or II, which, unless an exemption applies, requires the manufacturer to submit a pre-market notification requesting FDA clearance for commercial distribution pursuant to Section 510(k) of the FFDCA. This process, known as 510(k) clearance, requires that the manufacturer demonstrate that the device is substantially equivalent to a previously cleared and legally marketed 510(k) device or a "pre-amendment" class III device for which pre-market approval applications, or PMAs, have not been required by the FDA. This process typically takes from four to twelve months, although it can take longer. Most class I devices are exempted from this 510(k) premarket submission requirement. Devices deemed by the FDA to pose the greatest risk, such as life-sustaining, life-supporting, or implantable devices, or those deemed not substantially equivalent to a legally marketed predicate device, are placed in class III. Class III devices typically require PMA approval. To obtain PMA approval, an applicant must demonstrate the reasonable safety and effectiveness of the device based, in part, on data obtained in clinical studies. PMA reviews generally last between one and two years, although they can take longer. Both the 510(k) and the PMA processes can be expensive and lengthy and may not result in clearance or approval. If we are required to submit our products for pre-market review by the FDA, we may be required to delay marketing while we obtain premarket clearance or approval from the FDA. There would be no assurance that we could ever obtain such clearance or approval.

Changes to a device that have received PMA approval typically require a new PMA or PMA supplement. Changes to a device that received 510(k) clearance which could significantly affect its safety or effectiveness, or that would constitute a major change in its intended use, require a new 510(k) clearance or possibly PMA approval. The FDA requires each manufacturer to make this determination initially, but the FDA can review any of these decisions and may disagree. If the FDA disagreed with our determination not to seek a new 510(k) clearance for a change to a previously marketed product, the FDA could require us to seek a new 510(k) clearance or pre-market approval. The FDA also could require us to cease manufacturing and/or recall the modified device until 510(k) clearance or pre-market approval was obtained. Also, in these circumstances, we could be subject to warning letters, adverse publicity, significant regulatory fines or penalties, seizure or injunctive action, or criminal prosecution.

In some cases, our customers or collaborators may use our RUO products in their own laboratory-developed tests, or LDTs, or in other FDA-regulated products for clinical diagnostic use. The FDA has historically exercised enforcement discretion in not enforcing the medical device regulations against LDTs. However, the FDA could assert jurisdiction over some or all LDTs, which may impact our customers' uses of our products or the sale of our products for LDT uses. A significant change in the way that the FDA regulates our products or the LDTs that our customers develop may require us to change our business model in order to maintain compliance with these laws. The FDA held a meeting in July 2010, during which it indicated that it intends to reconsider its policy of enforcement discretion and to begin drafting a new oversight framework for LDTs.

If our products become subject to regulation as a medical device, we would become subject to additional FDA requirements, and we could be subject to unannounced inspections by the FDA and other governmental authorities, which could increase our costs of doing business. Specifically, manufacturers of medical devices must comply with various requirements of the FFDCA and its implementing regulations, including:

- the Quality System Regulation, which covers the methods and documentation of the design, testing, control, manufacturing, labeling, quality assurance, packaging, storage, and shipping of our product;
- labeling regulations;
- medical device reporting, or MDR, regulations;
- correction and removal regulations; and
- post-market surveillance regulations, which include restrictions on marketing and promotion.

We would need to continue to invest significant time and other resources to ensure ongoing compliance with FDA quality system regulations and other post-market regulatory requirements. Although we are continuing to evaluate these issues in light of the new guidance, we currently do not have any specific plans to seek regulatory approvals.

Our failure to comply with applicable FDA regulatory requirements, or our failure to timely and adequately respond to inspectional observations, could result in enforcement action by the FDA, which may include the following sanctions:

- fines, injunctions, and civil penalties;
- recall or seizure or our products;

- operating restrictions, partial suspension, or total shutdown of production;
- delays in clearance or approval, or failure to obtain approval or clearance of future product candidates or product modifications;
- restrictions on labeling and promotion;
- adverse publicity, warning letters, fines, or injunctions;
- withdrawal of previously granted clearances or approvals; and
- criminal prosecution.

International sales of medical devices are subject to foreign government regulations, which vary substantially from country to country. The primary regulatory environment in Europe is that of the European Union, or EU, which includes most of the major countries in Europe. Currently, 28 countries make up the EU. Other countries, such as Switzerland, have voluntarily adopted laws and regulations that mirror those of the EU with respect to medical devices. The EU has adopted numerous directives and standards regulating the design, manufacture, clinical trials, labeling, and adverse event reporting for medical devices. Devices that comply with the requirements of a relevant directive will be entitled to bear the CE conformity marking, indicating that the device conforms to the essential requirements of the applicable directives and, accordingly, can be commercially distributed throughout Europe. Outside of the EU, regulatory approval needs to be sought on a country-by-country basis in order to market medical devices. Although there is a trend towards harmonization of quality system standards, regulations in each country may vary substantially which can affect timelines of introduction. Additionally, we understand that RUO products, such as ours, are not currently subject to regulation as medical devices in the EU or by agencies comparable to the FDA in other countries.

Property and Environmental Matters

We lease approximately 48,000 square feet of office and laboratory space at our headquarters in South San Francisco, California under a lease that expires in April 2020. The leases for approximately 28,000 square feet of manufacturing and office space at our current facility in Singapore will terminate on September 30, 2014. Additionally, we have entered into a lease for a new manufacturing facility in Singapore, which expires on June 1, 2022, and we expect to consolidate our manufacturing operations in the new space in the third quarter of 2014. As of December 31, 2013, we also leased office space in Japan, China, and France, with various expiration dates through March 2016. We believe that our existing office, laboratory and manufacturing space, together with additional space and facilities under our new Singapore lease and otherwise available on commercially reasonable terms, will be sufficient to meet our needs through 2016.

Our research and development and manufacturing processes involve the controlled use of hazardous materials, including flammables, toxics, corrosives, and biologics. Our research and manufacturing operations produce hazardous biological and chemical waste products. We seek to comply with applicable laws regarding the handling and disposal of such materials. Given the small volume of such materials used or generated at our facilities, we do not expect our compliance efforts to have a material effect on our capital expenditures, earnings, and competitive position. However, we cannot eliminate the risk of accidental contamination or discharge and any resultant injury from these materials. We do not currently maintain separate environmental liability coverage and any such contamination or discharge could result in significant cost to us in penalties, damages, and suspension of our operations.

Geographic Information

During the last three years, a majority of our revenue was generated within the United States and Europe and a majority of our long-lived assets are located within the United States and Singapore. Product revenue received from customers outside the United States totaled $33.9 million, or 48% of our total product revenue, in 2013, compared to $24.2 million, or 47% of our total product revenue, in 2012, and $18.9 million, or 47% of our total product revenue, in 2011. Please see Note 14 of the notes to our audited consolidated financial statements for additional information for geographic areas.

Seasonality

In 2010, 2011, and 2012, our product revenue was higher in the fourth quarter of the year than in the first quarter of the next year reflecting numerous factors, including, among others, seasonal variations in customer operations and customer budget and capital spending cycles.

Employees

As of December 31, 2013, we had 325 employees, of which 71 work in research and development, 59 work in general and administrative, 98 work in manufacturing, and 97 work in sales, sales and technical support, and marketing. None of our employees are represented by a labor union or are the subject of a collective bargaining agreement.

Corporate and Available Information

We were incorporated in California in May 1999 as Mycometrix Corporation, changed our name to Fluidigm Corporation in April 2001, and reincorporated in Delaware in July 2007. Our principal executive offices are located at 7000 Shoreline Court, Suite 100, South San Francisco, California 94080. Our telephone number is (650) 266-6000. Our website address is www.fluidigm.com. We make available on our website, free of charge, our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and any amendments to those reports, as soon as reasonably practicable after we electronically file such material with, or furnish it to, the Securities and Exchange Commission, or SEC. Our SEC reports can be accessed through the investor relations page of our website located at http://investors.fluidigm.com/sec.cfm. Additionally, a copy of this Annual Report on Form 10-K is located at the SEC's Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. Information on the operation of the Public Reference Room can be obtained by calling the SEC at 1-800-SEC-0330.

We webcast our earnings calls and certain events we participate in or host with members of the investment community on our investor relations page of our website. Corporate governance information, including our board committee charters, code of ethics, and corporate governance principles, is also available on our investor relations page of our website located at http://investors.fluidigm.com/governance.cfm. The contents of our website are not incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC, and any references to our website are intended to be inactive textual references only.

Executive Officers

The following table sets forth the names, ages (as of February 28, 2014) and positions of our executive officers:

Name	Age	Position
Gajus V. Worthington	44	President, Chief Executive Officer, and Director
Vikram Jog	57	Chief Financial Officer
Robert C. Jones	59	Executive Vice President, Research and Development
William M. Smith	62	Executive Vice President, Legal Affairs, General Counsel, and Secretary
Fredric Walder	56	Chief Operating Officer
Mai Chan (Grace) Yow	55	Executive Vice President, Worldwide Manufacturing and Managing Director of Fluidigm Singapore Pte. Ltd.

Gajus V. Worthington is a co-founder of Fluidigm and has served as our President, Chief Executive Officer and a director since our inception in June 1999. From May 1994 to April 1999, Mr. Worthington held various staff and management positions at Actel Corporation, a public semiconductor corporation that was sold to Microsemi Corporation in 2010. Mr. Worthington received a B.S. in Physics and an M.S. in Electrical Engineering from Stanford University.

Vikram Jog has served as our Chief Financial Officer since February 2008. From April 2005 to February 2008, Mr. Jog served as Chief Financial Officer for XDx, Inc., a molecular diagnostics company. From March 2003 to April 2005, Mr. Jog was a Vice President of Applera Corporation, a life science company that is now part of Thermo Fisher Scientific, and Vice President of Finance for its related businesses, Celera Genomics and Celera Diagnostics. From April 2001 to March 2003, Mr. Jog was Vice President of Finance for Celera Diagnostics and Corporate Controller of Applera Corporation. Mr. Jog received a Bachelor of Commerce degree from Delhi University and an M.B.A. from Temple University. Mr. Jog is a member of the American Institute of Certified Public Accountants.

Robert C. Jones has served as our Executive Vice President, Research and Development since August 2005. From August 1984 to July 2005, Mr. Jones held various managerial and research and development positions at Applied Biosystems, a laboratory equipment and supplies manufacturer that was a division of Applera Corporation, including: Senior Vice President Research and Development from April 2001 to August 2005; Vice President and General Manager Informatics Division from 1998 to 2001; and Vice President PCR Business Unit from 1994 to 1998. Mr. Jones received a BSEE in Electrical Engineering and an MSEE in Computer Engineering from the University of Washington.

William M. Smith has served as our Executive Vice President, Legal Affairs since February 2012, and as General Counsel and our Secretary since May 2000. From May 2000 to February 2012, Mr. Smith served as our Vice

President, Legal Affairs and served as a director from May 2000 to April 2008. Mr. Smith served as an associate and then as a partner at the law firm of Townsend and Townsend and Crew, LLP from 1985 through April 2008. Mr. Smith received a J.D. and an M.P.A. from the University of Southern California and a B.A. in Biology from the University of California, San Diego.

Fredric Walder has served as our Chief Operating Officer since December 2012. From May 2010 to December 2012, Mr. Walder served as our Chief Business Officer. From August 1992 to April 2010, he served in various senior executive positions at Thermo Fisher Scientific, a laboratory equipment and supplies manufacturer, including as Senior Vice President, Customer Excellence from November 2006 to April 2010, and Division President, Thermo Electron Corporation from January 2000 to November 2006. Mr. Walder holds a B.S. in Chemistry from the University of Massachusetts.

Mai Chan (Grace) Yow has served as Executive Vice President, Worldwide Manufacturing of Fluidigm Singapore Pte. Ltd., our Singapore subsidiary, since February 2012, and as Managing Director of Fluidigm Singapore Pte. Ltd. since March 2006. Ms. Yow served as Vice President, Worldwide Manufacturing, from March 2006 to January 2012. From June 2005 to March 2006, Ms. Yow served as General Manager of Fluidigm Singapore Pte. Ltd. From August 2004 to May 2005, Ms. Yow served as Vice President Engineering (Asia) for Kulicke and Soffa, a public semiconductor equipment manufacturer. From March 1991 to July 2004, Ms. Yow served as Director, Assembly Operations, Plant Facilities and EHS, for National Semiconductor Singapore, a semiconductor fabrication subsidiary of National Semiconductor Corporation. Ms. Yow received a B.E. in Electronic Engineering from Curtin University, a Certificate in Management Studies from the Singapore Institute of Management, and a Diploma in Electrical Engineering from Singapore Polytechnic.

Recent Developments

Acquisition of DVS Sciences, Inc.

On February 13, 2014, we completed our acquisition of DVS (which changed its name to Fluidigm Sciences Inc. subsequent to the acquisition), pursuant to an agreement and plan of merger dated as of January 28, 2014. Pursuant to the merger agreement, DVS became our wholly-owned subsidiary. DVS's wholly-owned subsidiary, DVS Sciences Inc., an Ontario corporation, or DVS Canada (which changed its name to Fluidigm Canada Inc. subsequent to the acquisition), remained a wholly-owned subsidiary of DVS.

The merger consideration payable by us to the former stockholders of DVS pursuant to the merger agreement consisted of approximately $117.2 million in cash (excluding the value of stock options and unvested restricted stock assumed by us), and 1,759,007 shares of our common stock. Of the aggregate cash consideration, $1.0 million was deposited in escrow to satisfy certain potential working capital adjustments, and of the stock consideration, 50.3030% of the shares was deposited into escrow to secure indemnification obligations under the merger agreement. In addition, under the terms of the merger agreement, stock options, both vested and unvested, and unvested restricted stock of DVS were converted into options and restricted stock, respectively, denominated in shares of our common stock pursuant to an exchange ratio specified in the merger agreement.

The cash consideration payable to the former stockholders of DVS was financed in part with the net proceeds from our underwritten public offering of 2.75% Senior Convertible Notes due 2034, as described in our Current Report on Form 8-K filed with the SEC on February 4, 2014.

Business of DVS

DVS Sciences Inc. was founded in 2004 as a Canadian corporation, referred to as DVS Canada. In 2010, the stockholders of DVS Canada exchanged their shares in DVS Canada for shares in a new parent company incorporated in Delaware, and DVS Canada became a wholly-owned subsidiary of DVS, the new Delaware parent corporation. DVS develops, manufactures, markets, and sells multi-parameter single-cell protein analysis systems. DVS's principal product is the CyTOF2 mass spectrometer, which analyzes cells labeled with heavy metal isotopes using atomic mass cytometry technology for applications in biological research. In addition, DVS offers reagents and reagent kits, as well as data analysis tools for use with its CyTOF2 instrument. For the year ended December 31, 2012 and the nine months ended September 30, 2013, DVS recognized revenue of $11.9 million and $18.5 million, respectively, and net (loss) income of ($2.6 million) and $1.5 million, respectively.

DVS's products target the research flow cytometry market. Existing flow cytometry technologies are high-throughput with single-cell analysis capabilities. However, a key limitation of traditional flow cytometry technologies is the use of fluorescent dyes to label antibodies for detection. These fluorescent labels have emission spectra that typically overlap, making it challenging to optimize reagents to analyze many protein markers at once. The maximum number of proteins target for traditional flow cytometry is approximately 18 with significant reagent optimization involved.

Similar to flow cytometry, mass cytometry is based primarily on antibodies for detection of proteins. However, rather than utilizing fluorescent labels, DVS's technological approach utilizes heavy metal isotope labels, which enables the ability to expand the number of parameters analyzed per individual cell to twice the number of conventional flow cytometry technologies.

DVS's customers include leading academic and research laboratories. In North America and Europe, DVS sells and markets its products through a direct sales force, other than in Germany, Switzerland, and Austria, where it relies on a manufacturer's representative. In Asia, it has focused its sales efforts to date on distributor relationships in Japan, Taiwan, Singapore, and Hong Kong. As of December 31, 2013, DVS had 84 full time employees. DVS maintains its commercial headquarters in Sunnyvale, California, where it also manufactures reagents. In addition, DVS manufactures instruments and conducts research and development at a facility outside Toronto, Ontario. DVS also maintains a European sales office outside London, England.

DVS and DVS Canada have sought patent protection in the United States and internationally for certain aspects of their technology through licensed intellectual property and owned intellectual property. For aspects of DVS technology for which patent protection may not be available, DVS and DVS Canada rely on protection through trade secrets, know-how or continuing technological innovation. A significant portion of DVS's and DVS Canada's owned patent portfolio is in the form of provisional application filings that would need to be converted to non-provisional U.S. patent applications or international patent applications. We cannot be sure that patents will be granted with respect to any of DVS's or DVS Canada's owned or licensed pending patent applications or with respect to any patent applications filed by DVS, DVS Canada, or their licensors in the future, nor can we be sure that any of DVS's or DVS Canada's existing owned or licensed patents or any patents that may be granted to DVS, DVS Canada or to their licensors in the future will protect such technology.

DVS and DVS Canada license intellectual property rights from third parties that are material to their businesses and operating results. In particular, in 2008, DVS Canada entered into a license agreement with MDS Inc., or MDS, through MDS's Sciex division, pursuant to which DVS Canada licensed from MDS patents that cover the core technology on which the CyTOF2 mass spectrometer was based. We understand that MDS subsequently assigned the licensed patents and the license agreement, and that the patents and license agreement are now held by PerkinElmer Health Sciences, Inc., or PerkinElmer. The PerkinElmer license agreement grants DVS Canada an exclusive, royalty bearing, worldwide license under the licensed patents in the field of inductively coupled plasma-based flow cytometry, including the related analysis of elemental tagged materials, and a non-exclusive license for reagents outside the field of ICP-based flow cytometry. Among other provisions, the license agreement obligates DVS Canada to grant to PerkinElmer a non-exclusive, royalty-free license for research and development to any improvements or developments relating to the subject matter of the licensed patents that are developed by DVS Canada. In addition, DVS Canada controls the prosecution and maintenance of the licensed patents within the field, and PerkinElmer controls the prosecution and maintenance of the licensed patents for reagents outside the field, subject in each case to consultation and fair consideration of comments from the other party. PerkinElmer retains enforcement rights with respect to the licensed patents. The license agreement obligates DVS Canada to make various royalty payments to PerkinElmer, with a current minimum annual royalty of 250,000 Canadian dollars. Unless earlier terminated in accordance with the license agreement, the license expires upon the expiration or invalidation of the last licensed patent, which we currently expect to occur no sooner than December 2025. PerkinElmer may terminate the license agreement for an uncured material breach or if DVS Canada becomes insolvent, makes an assignment for the benefit of creditors, or has a petition in bankruptcy filed against it. Any loss, termination, or adverse modification of intellectual property rights licensed by DVS Canada from PerkinElmer or other third parties could have a material adverse effect on our business, operating results, and financial condition. For additional information, see the section entitled "Risk factors—Risks Related to Our Recent Acquisition of DVS" in this Form 10-K.

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ITEM 1A. RISK FACTORS

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

On February 13, 2014, we completed the acquisition of DVS Sciences, Inc., or DVS (which changed its name to Fluidigm Sciences Inc. immediately subsequent to the acquisition), which develops, manufactures, markets, and sells multi-parameter single-cell protein analysis systems. The risk factors set forth under "Risks Related to Fluidigm's Business and Strategy" relate principally to our business of manufacturing, marketing, and selling microfluidic systems for single-cell genomics, applied genotyping, and sample preparation for targeted resequencing. For the separate risks relating to the business of DVS, please refer to the section of these risk factors captioned "Risks Related to Our Recent Acquisition of DVS."

Risks Related to Fluidigm's Business and Strategy

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

The application of our technologies to single-cell genomics, digital polymerase chain reaction, or digital PCR, and sample preparation for next-generation DNA sequencing are emerging market opportunities. We believe these opportunities will take several years to develop or mature and we cannot be certain that these market opportunities will develop as we expect. For example, we launched our C_1 Single-Cell Auto Prep System in June 2012, which applies our technology to, among other things, improve single-cell analytic workflow for single-cell genomics. The future growth of the single-cell genomics market and the success of our new system depend on many factors beyond our control, including recognition and acceptance by the scientific community, and the growth, prevalence, and costs of competing methods of genetic analysis. If the market for single-cell genomics, digital PCR, and sample preparation for next-generation DNA sequencing do not develop as we expect, our business may be adversely affected.

Additionally, our success in these emerging markets may depend to a large extent on our ability to successfully market and sell products using our technologies. If we are not able to successfully market and sell our products, or to achieve the revenue or margins we expect, our operating results may be harmed and we may not recover our product development and marketing expenditures. In addition, our product development and strategic plans may change, which could delay or impede our entry into emerging markets.

Our financial results may vary significantly from quarter-to-quarter due to a number of factors, which may lead to volatility in our stock price.

Our quarterly revenue and results of operations have varied in the past and may continue to vary significantly from quarter-to-quarter. For example, in 2010, 2011, and 2012, we experienced higher sales in the fourth quarter than in the first quarter of the next fiscal year. In addition, revenue from sales of our instruments relative to sales of our consumables may fluctuate or deviate significantly from expectations. The variability in our quarterly results of operations, including revenue from sales of our instruments relative to our consumables, may lead to volatility in our stock price as research analysts and investors respond to these quarterly fluctuations. These fluctuations are due to numerous factors that are difficult to forecast, including: fluctuations in demand for our products; changes in customer budget cycles and capital spending; seasonal variations in customer operations; tendencies among some customers to defer purchase decisions to the end of the quarter; the large unit value of our systems; changes in our pricing and sales policies or the pricing and sales policies of our competitors; our ability to design, manufacture and deliver products to our customers in a timely and cost-effective manner; quality control or yield problems in our manufacturing operations; our ability to timely obtain adequate quantities of the components used in our products; new product introductions and enhancements by us and our competitors; unanticipated increases in costs or expenses; our complex, variable and, at times, lengthy sales cycle; global economic conditions; and fluctuations in foreign currency exchange rates. Additionally, we have certain customers who have historically placed large orders in multiple quarters during a calendar year. A significant reduction in orders from one or more of these customers could adversely affect our

revenue and operating results, and if these customers defer or cancel purchases or otherwise alter their purchasing patterns, our quarter-to-quarter financial results could be significantly impacted.

The foregoing factors, as well as other factors, could materially and adversely affect our quarterly and annual results of operations. In addition, a significant amount of our operating expenses are relatively fixed due to our manufacturing, research and development, and sales and general administrative efforts. Any failure to adjust spending quickly enough to compensate for a revenue shortfall could magnify the adverse impact of such revenue shortfall on our results of operations. We expect that our sales will continue to fluctuate on a quarterly basis and that our financial results for some periods may be below those projected by securities analysts, which could significantly decrease the price of our common stock.

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We have incurred losses since inception, and we may continue to incur substantial losses for the foreseeable future.
We have a limited operating history and have incurred significant losses in each fiscal year since our inception, including net losses of $16.5 million, $19.0 million, and $22.5 million during the years 2013, 2012, and 2011, respectively. As of December 31, 2013, we had an accumulated deficit of $257.3 million. These losses have resulted principally from costs incurred in our research and development programs, and from our manufacturing costs and selling, general, and administrative expenses. We may continue to incur substantial operating and net losses and negative cash flow from operations. We expect that our selling, general, and administrative expenses will continue to increase due to the additional operational and reporting costs associated with being a public company. We anticipate that our business will generate operating losses until we successfully implement our commercial development strategy and generate significant additional revenue to support our level of operating expenses. Because of the numerous risks and uncertainties associated with our commercialization efforts and future product development, we are unable to predict when we will become profitable, and we may never become profitable. Even if we do achieve profitability, we may not be able to sustain or increase our profitability.

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

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

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

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

The current leases for our manufacturing facility in Singapore will terminate on September 30, 2014 and our current lease for office and laboratory space at our headquarters in South San Francisco expires in April 2020. On October 14, 2013, Fluidigm Singapore Pte. Ltd., or Fluidigm Singapore, our wholly-owned subsidiary, accepted an offer of tenancy relating to the lease of a new manufacturing facility in Singapore, which expires on June 1, 2022. We expect to consolidate our manufacturing operations in the new space in the third quarter of 2014. Such a move will involve

significant expense in connection with the establishment of new clean rooms, the movement and installation of key manufacturing equipment, and qualification of the new facility, and we cannot assure you that such a move would not delay or otherwise adversely affect our manufacturing activities. If our manufacturing capabilities are impaired by our move, we may not be able to manufacture and ship our products in a timely manner, which would adversely impact our business.

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

We may encounter unforeseen situations in the manufacturing and assembly of our products that would result in delays or shortfalls in our production. For example, we expect to consolidate our manufacturing operations in a new facility in the third quarter of 2014. Such a move will involve significant expense, and we cannot assure you that such a move would not delay or

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otherwise adversely affect our manufacturing activities. In addition, our production processes and assembly methods may have to change to accommodate any significant future expansion of our manufacturing capacity, which may increase our manufacturing costs, delay production of our products, reduce our product margin, and adversely impact our business. If our manufacturing activities are adversely impacted by our move, or if we are otherwise unable to keep up with demand for our products by successfully manufacturing, assembling, testing, and shipping our products in a timely manner, our revenue could be impaired, market acceptance for our products could be adversely affected and our customers might instead purchase our competitors' products.

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

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

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

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

- The IFCs used in our microfluidic systems are fabricated using a specialized polymer, and other specialized materials, that are available from a limited number of sources. In the past, we have encountered quality issues that have reduced our manufacturing yield or required the use of additional manufacturing processes.
- Specialized pneumatic and electronic components for our C_1 Single-Cell Auto Prep System are available from a limited number of sources.
- The raw materials for our DELTAgene and SNPtype assays and Access Array Target-Specific primers are available from a limited number of sources.

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

- we may be subject to increased component or assembly costs;
- we may not be able to obtain adequate supply or services in a timely manner or on commercially reasonable terms;
- our suppliers or service providers may make errors in manufacturing or assembly of components that could negatively affect the efficacy of our products or cause delays in shipment of our products; and
- our suppliers or service providers may encounter capacity constraints or financial hardships unrelated to our demand for components or services, which could inhibit their ability to fulfill our orders and meet our requirements.

We have in the past experienced quality control and supply problems with some of our suppliers, such as manufacturing errors, and may again experience problems in the future. We may not be able to quickly establish additional or replacement suppliers, particularly for our single source components, or assembly service providers. Any interruption or delay in the supply of components or materials or assembly of our instruments, or our inability to obtain components, materials, or assembly services from alternate sources at acceptable prices in a timely manner, could impair our ability to meet the demand of our customers and cause them to cancel orders or switch to competitive products.

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

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

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

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

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

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

The markets for our products are characterized by rapidly changing technology, evolving industry standards, changes in customer needs, emerging competition, new product introductions, and strong price competition. We compete with both established and development stage life science research companies that design, manufacture, and market instruments and consumables for gene expression analysis, single-cell targeted gene expression analysis, genotyping, PCR, digital PCR, other nucleic acid detection, and additional applications using well established laboratory techniques, as well as newer technologies such as bead encoded arrays, microfluidics, nanotechnology, high-throughput DNA sequencing, microdroplets and photolithographic arrays. Most of our current competitors have significantly greater name recognition, greater financial and human resources, broader product lines and product packages, larger sales forces, larger existing installed bases, larger intellectual property portfolios, and greater experience and scale in research and development, manufacturing, and marketing than we do. For example, companies such as Affymetrix, Inc., Agilent Technologies, Inc., Bio-Rad Laboratories, Inc., Illumina, Inc., Life Technologies Corporation (now part of Thermo Fisher Scientific), LGC Limited, Luminex Corporation, NanoString Technologies, Inc., PerkinElmer, Inc. (through its acquisition of Caliper Life Sciences, Inc.), RainDance Technologies, Inc., Roche Applied Science (a division of Roche Diagnostics Corporation), Sequenom, Inc., Thermo Fisher Scientific Inc., and WaferGen Bio-systems, Inc. have products that compete in certain segments of the market in which we sell our products.

Competitors may be able to respond more quickly and effectively than we can to new or changing opportunities, technologies, standards, or customer requirements. In light of these advantages, even if our technology is more effective than the product or service offerings of our competitors, current or potential customers might accept competitive products and services in lieu of purchasing our technology. We anticipate that we will face increased competition in the future as existing companies and competitors develop new or improved products and as new

companies enter the market with new technologies. Increased competition is likely to result in pricing pressures, which could reduce our profit margins and increase our sales and marketing expenses. In addition, mergers, consolidations, or other strategic transactions between two or more of our competitors, or between our competitor and one of our key customers, could change the competitive landscape and weaken our competitive position, adversely affecting our business.

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

We expect that our revenue in the foreseeable future will be derived primarily from sales of our microfluidic systems and integrated fluidic circuits, or IFCs, to academic institutions, clinical laboratories that use our technology to develop tests, and pharmaceutical, biotechnology, and Ag-Bio companies worldwide. Our success will depend upon their demand for and use of

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our products. Accordingly, the spending policies of these customers could have a significant effect on the demand for our technology. These policies may be based on a wide variety of factors, including concerns regarding the federal government budget sequestration, the availability of resources to make purchases, the spending priorities among various types of equipment, policies regarding spending during recessionary periods, and changes in the political climate. In addition, academic, governmental, and other research institutions that fund research and development activities may be subject to stringent budgetary constraints that could result in spending reductions, reduced allocations, or budget cutbacks, which could jeopardize the ability of these customers to purchase our products. Our operating results may fluctuate substantially due to reductions and delays in research and development expenditures by these customers. For example, reductions in capital and operating expenditures by these customers may result in lower than expected sales of our microfluidic systems and IFCs. These reductions and delays may result from factors that are not within our control, such as:

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

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

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

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

Our products could become subject to regulation as medical devices by the U.S. Food and Drug Administration, or FDA, or other regulatory agencies in the future.

Our products are currently labeled, promoted and sold to academic institutions, life sciences laboratories, and pharmaceutical, biotechnology, and Ag-Bio companies for research purposes only, and not as diagnostic tests or medical devices. As products labeled and intended for research use only, they are subject only to limited regulation as

medical devices by the FDA under 21 Code of Federal Regulations Section 809.10(c) with respect to their labeling. Research use only products are not currently subject to regulation as medical devices by comparable agencies of other countries. However, the FDA could disagree with our conclusion that our products are for research use only. In addition, if we change the labeling or promotion of our products in the future to include indications for human diagnostic applications or medical uses, or we have knowledge that our customers are using our products for clinical diagnostic or therapeutic purposes, our products or related applications could

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be subject to additional regulation as in vitro diagnostic devices, such as under the FDA's pre- and post-market regulations for medical devices. For example, if we wish to label, promote or advertise our products for use in performing clinical diagnostics, we would first need to obtain FDA pre-market clearance or approval (depending on any product's specific intended use and any such modified labeling claims), unless otherwise exempt from clearance or approval requirements. Obtaining FDA clearance or approval can be expensive and uncertain, and generally takes several months to years to obtain, and may require detailed and comprehensive scientific and clinical data. Notwithstanding the expense, these efforts may never result in FDA clearance or approval. Even if we were to obtain regulatory approval or clearance, it may not be for the uses we believe are important or commercially attractive. Further, the FDA may expand its regulatory oversight of our products or the products of our customers, which could impose restrictions on our ability to market and sell our products. For example, our customers may elect to use our research use only labeled products in their own laboratory developed tests, or LDTs, for clinical diagnostic use. The FDA has historically exercised enforcement discretion in not enforcing the medical device regulations against laboratory offering LDTs. However, the FDA could assert jurisdiction over some or all LDTs, which may impact our customers' uses of our products. A significant change in the way that the FDA regulates our products or any LDTs that our customers develop may require us to change our business model in order to maintain compliance with these laws. The FDA held a meeting in July 2010, during which it indicated that it intends to reconsider its policy of enforcement discretion and to begin drafting a new oversight framework for LDTs. Recent comments by FDA Commissioner Margaret Hamburg in June 2013 indicate that the FDA is working on a new risk-based framework to regulate LDTs. We cannot predict the ultimate timing or form of any FDA guidance or regulation on LTDs.

Additionally, on November 25, 2013, the FDA issued Final Guidance "Distribution of In Vitro Diagnostic Products Labeled for Research Use Only." The guidance emphasizes that the FDA will review the totality of the circumstances when it comes to evaluating whether equipment and testing components are properly labeled as RUO. The final guidance states that merely including a labeling statement that the product is for research purposes only will not necessarily render the device exempt from the FDA's clearance, approval, or other requirements if the circumstances surrounding the distribution of the product indicate that the manufacturer knows its product is, or intends for its product to be, offered for clinical diagnostic uses. These circumstances may include written or verbal marketing claims or links to articles regarding a product's performance in clinical applications and a manufacturer's provision of technical support for clinical applications. If the FDA imposes significant changes to the regulation of LDTs, or modifies its approach to our products labeled for research use only, it could reduce our revenue or increase our costs and adversely affect our business, prospects, results of operations or financial condition. In addition, if the FDA determined that our products labeled for research use only were intended for use in clinical investigation or diagnosis, those products could be considered misbranded or adulterated under the Federal Food, Drug, and Cosmetic Act.

We may be required to proactively achieve compliance with certain FDA regulations and to conform our manufacturing operations to the FDA's good manufacturing practice regulations for medical devices, known as the Quality System Regulation, or QSR, as part of our contracts with customers or as part of our collaborations with third parties. In addition, we may voluntarily seek to conform our manufacturing operations to QSR requirements. For clinical diagnostic products that are regulated as medical devices, the FDA enforces the QSR through pre-approved inspections and periodic unannounced inspections of registered manufacturing facilities. If we are subject to QSR requirements, the failure to comply with those requirements or take satisfactory corrective action in response to an adverse QSR inspection could result in enforcement actions, including a public warning letter or an untitled letter, a delay in approving or clearing, or a refusal to approve or clear, our products, a shutdown of manufacturing operations, a product recall, civil or criminal penalties or other sanctions, which could in turn cause our sales and business to suffer.

If we are unable to recruit and retain key executives, scientists and technical support personnel, we may be unable to achieve our goals.

Our performance is substantially dependent on the performance of our senior management, particularly Gajus V. Worthington, our president and chief executive officer. Additionally, to expand our research and product development efforts, we need key scientists skilled in areas such as molecular and cellular biology, assay development, and manufacturing. We also need highly trained technical support personnel with the necessary scientific background and

ability to understand our systems at a technical level to effectively support potential new customers and the expanding needs of current customers. Competition for these people is intense. Because of the complex and technical nature of our systems and the dynamic market in which we compete, any failure to attract and retain a sufficient number of qualified employees could materially harm our ability to develop and commercialize our technology.

The loss of the services of any member of our senior management or our scientific or technical support staff might significantly delay or prevent the development of our products or achievement of other business objectives by diverting management's attention to transition matters and identification of suitable replacements, if any, and could have a material

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adverse effect on our business. In addition, our research and product development efforts could be delayed or curtailed if we are unable to attract, train and retain highly skilled employees, particularly, senior scientists and engineers. We do not maintain fixed term employment contracts or significant key man life insurance with any of our employees.

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

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

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

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

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

The global credit and financial markets have in recent years experienced volatility and disruptions, including diminished liquidity and credit availability, increased concerns about inflation and deflation, and the downgrade of U.S. debt and exposure risks on other sovereign debts, decreased consumer confidence, lower economic growth, volatile energy costs, increased unemployment rates, and uncertainty about economic stability. Volatility and disruption of financial markets could limit our customers' ability to obtain adequate financing or credit to purchase and pay for our products in a timely manner or to maintain operations, which could result in a decrease in sales volume that could harm our results of operations. General concerns about the fundamental soundness of domestic and international economies may also cause our customers to reduce their purchases. Changes in governmental banking, monetary, and fiscal policies to address liquidity and increase credit availability may not be effective. Significant government investment and allocation of resources to assist the economic recovery of sectors which do not include our customers may reduce the resources available for government grants and related funding for life science, Ag-Bio, and clinical research and development. Continuation or further deterioration of these financial and macroeconomic conditions could significantly harm our sales, profitability and results of operations.

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

During the years 2013, 2012, and 2011, approximately 48%, 47%, and 47%, respectively, of our product revenue was generated from sales to customers located outside of the United States. We believe that a significant percentage of our future revenue will come from international sources as we expand our overseas operations and develop opportunities in other international areas. Engaging in international business inherently involves a number of difficulties and risks, including:

- required compliance with existing and changing foreign regulatory requirements and laws;

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- required compliance with anti-bribery laws, such as the U.S. Foreign Corrupt Practices Act and U.K. Bribery Act, data privacy requirements, labor laws and anti-competition regulations;
- export or import restrictions;
- laws and business practices favoring local companies;
- longer payment cycles and difficulties in enforcing agreements and collecting receivables through certain foreign legal systems;
- unstable economic, political, and regulatory conditions;
- potentially adverse tax consequences, tariffs, customs charges, bureaucratic requirements, and other trade barriers;
- difficulties and costs of staffing and managing foreign operations; and
- difficulties protecting or procuring intellectual property rights.

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

In addition, a majority of our product sales are currently denominated in U.S. dollars and fluctuations in the value of the U.S. dollar relative to foreign currencies could decrease demand for our products and adversely impact our financial performance. For example, if the value of the U.S. dollar increases relative to foreign currencies, our products could become more costly to the international consumer and therefore less competitive in international markets, or if the value of the U.S. dollar decreases relative to the Singapore dollar, it would become more costly in U.S. dollars for us to manufacture our products in Singapore.

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

If we are unable to manage our anticipated growth effectively, our business could be harmed.

The rapid growth of our business has placed a significant strain on our managerial, operational, and financial resources and systems. To execute our anticipated growth successfully, we must continue to attract and retain qualified personnel and manage and train them effectively. We must also upgrade our internal business processes and capabilities to create the scalability that a growing business demands.

We believe our facilities located in Singapore and South San Francisco, California, are sufficient to meet our short-term manufacturing needs. The current leases for our facilities in Singapore will terminate on September 30, 2014 and our current lease for office and laboratory space at our headquarters in South San Francisco expires in April 2020. On October 14, 2013, Fluidigm Singapore accepted an offer of tenancy relating to the lease of a new manufacturing facility in Singapore, which expires on June 1, 2022. We expect to consolidate our manufacturing operations in the new space in the third quarter of 2014. Such a move will involve significant expense in connection with the establishment of new clean rooms, the movement and installation of key manufacturing equipment, and qualification of our new facility, and we cannot assure you that such a move would not delay or otherwise adversely affect our manufacturing activities. If our ability to utilize the new facility for manufacturing operations is delayed, we may not be able to meet demand for our microfluidic systems, which could adversely impact our business. We cannot provide assurances that we will be able to secure a lease on a different manufacturing facility on acceptable terms and on a timely basis, if at all, to meet our future manufacturing needs.

Further, our anticipated growth will place additional strain on our suppliers and manufacturing facilities, resulting in an increased need for us to carefully monitor quality assurance. Any failure by us to manage our growth effectively could have an adverse effect on our ability to achieve our development and commercialization goals.

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

Our microfluidic systems utilize novel and complex technology applied on a nanoliter scale and such systems may develop or contain undetected defects or errors. We cannot assure you that material performance problems, defects, or errors will not arise, and as we increase the density and integration of our microfluidic systems, these risks may

increase. We generally provide warranties that our microfluidic systems will meet performance expectations and will be free from defects.

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We also provide warranties relating to other parts of our microfluidic systems. The costs incurred in correcting any defects or errors may be substantial and could adversely affect our operating margins.

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

If our products contain defects, we may experience:

- a failure to achieve market acceptance or expansion of our product sales;
- loss of customer orders and delay in order fulfillment;
- damage to our brand reputation;
- increased cost of our warranty program due to product repair or replacement;
- product recalls or replacements;
- inability to attract new customers;
- diversion of resources from our manufacturing and research and development departments into our service department; and
- legal claims against us, including product liability claims, which could be costly and time consuming to defend and result in substantial damages.

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

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

To use our products, and our BioMark System in particular, customers typically need to purchase specialized reagents. Any interruption in the availability of these reagents for use in our products could limit our ability to market our products.

Our products, and our BioMark System in particular, must be used in conjunction with one or more reagents designed to produce or facilitate the particular biological or chemical reaction desired by the user. Many of these reagents are highly specialized and available to the user only from a single supplier or a limited number of suppliers. Although we sell reagents for use with certain of our products, our customers may purchase these reagents directly from third-party suppliers, and we have no control over the supply of those materials. In addition, our products are designed to work with these reagents as they are currently formulated. We have no control over the formulation of reagents sold by third-party suppliers, and the performance of our products might be adversely affected if the formulation of these reagents is changed. If one or more of these reagents were to become unavailable or were reformulated, our ability to market and sell our products could be materially and adversely affected.

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

do not have any contractual supply agreements for these real-time qPCR reagents, and we cannot assure you that these reagents will continue to be available to our customers for use with our systems, or that these patent holders will not seek to enforce their patents against us, our customers, or suppliers.

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We have limited experience in marketing, selling, and distributing our products, and if we are unable to expand our direct sales and marketing force or distribution capabilities to adequately address our customers' needs, our business may be adversely affected.

We have limited experience in marketing, selling, and distributing our products. Our BioMark and EP1 Systems for genomic analysis were introduced for commercial sale in 2006 and 2008, respectively. Our Access Array System for sample preparation was introduced for commercial sale in 2009, our BioMark HD System for genomic analysis was introduced for commercial sale in 2011, we began producing and selling assays for use with our IFCs in May 2011, and we launched our C_1 Single-Cell Auto Prep System for single cell sample preparation for single-cell analysis in June 2012. We may not be able to market, sell, and distribute our products effectively enough to support our planned growth. We sell our products primarily through our own sales force and through distributors in certain territories. Our future sales will depend in large part on our ability to develop and substantially expand our direct sales force and to increase the scope of our marketing efforts. Our products are technically complex and used for highly specialized applications. As a result, we believe it is necessary to develop a direct sales force that includes people with specific scientific backgrounds and expertise, and a marketing group with technical sophistication. Competition for such employees is intense. We may not be able to attract and retain personnel or be able to build an efficient and effective sales and marketing force, which could negatively impact sales of our products and reduce our revenue and profitability.

In addition, we may continue to enlist one or more sales representatives and distributors to assist with sales, distribution, and customer support globally or in certain regions of the world. If we do seek to enter into such arrangements, we may not be successful in attracting desirable sales representatives and distributors, or we may not be able to enter into such arrangements on favorable terms. If our sales and marketing efforts, or those of any third-party sales representatives and distributors, are not successful, our technologies and products may not gain market acceptance, which would materially and adversely impact our business operations.

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

The Sarbanes-Oxley Act requires, among other things, that we maintain effective internal control over financial reporting and disclosure controls and procedures. In particular, we must perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on the effectiveness of our internal control over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act. Our testing may reveal deficiencies in our internal control over financial reporting that are deemed to be material weaknesses. Our compliance with Section 404 requires that we incur substantial accounting expense and expend significant management time on compliance-related issues. We currently do not have an internal audit group, and we continue to evaluate our need for additional accounting and financial staff with appropriate public company experience and technical accounting knowledge. Moreover, if we do not comply with the requirements of Section 404, or if we or our independent registered public accounting firm identify deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, the market price of our stock could decline and we could be subject to sanctions or investigations by the NASDAQ Global Market, or NASDAQ, the SEC or other regulatory authorities, which would require additional financial and management resources.

Risks associated with a company-wide implementation of an enterprise resource planning, or ERP, system may adversely affect our business and results of operations or the effectiveness of internal control over financial reporting.

We have been implementing a company-wide ERP system to handle the business and financial processes within our operations and corporate functions. ERP implementations are complex and time-consuming projects that involve substantial expenditures on system software and implementation activities that can continue for several years. ERP implementations also require transformation of business and financial processes in order to reap the benefits of the ERP system. Our business and results of operations may be adversely affected if we experience operating problems and/or cost overruns during the ERP implementation process, or if the ERP system and the associated process changes do not give rise to the benefits that we expect. Additionally, if we do not effectively implement the ERP system as planned or if the system does not operate as intended, it could adversely affect the effectiveness of our internal controls over financial reporting.

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

We believe that our existing cash and cash equivalents will be sufficient to meet our anticipated cash requirements for at least the next 18 months. However, we may need to raise substantial additional capital for various purposes, including:

- expanding the commercialization of our products;
- funding our operations;

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- furthering our research and development; and
- acquiring other businesses or assets and licensing technologies.

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

- market acceptance of our products;
- the cost of our research and development activities;
- the cost of filing and prosecuting patent applications;
- the cost of defending, in litigation or otherwise, any claims that we infringe third-party patents or violate other intellectual property rights;
- the cost and timing of regulatory clearances or approvals, if any;
- the cost and timing of establishing additional sales, marketing, and distribution capabilities;
- the cost and timing of establishing additional technical support capabilities;
- the effect of competing technological and market developments; and
- the extent to which we acquire or invest in businesses, products, and technologies, although we currently have no commitments or agreements relating to any of these types of transactions.

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

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

In general, 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, or NOLs, to offset future taxable income. If we undergo one or more ownership changes, our ability to utilize NOLs could be limited by Section 382 of the Internal Revenue Code. Future changes in our stock ownership, some of which are outside of our control, could result in an ownership change under Section 382 of the Internal Revenue Code.

Risks Related to Our Recent Acquisition of DVS

Actual results relating to DVS may differ from any guidance issued by us concerning future revenue and revenue growth of DVS or the anticipated impact of the acquisition on the operating results of the combined company, and these differences could be material.

We cannot provide assurances with respect to the future revenues or revenue growth rates we may realize as a result of our acquisition of DVS. DVS’s revenues have increased substantially in recent years, and we do not expect revenue growth rates from sales of DVS’s products to continue to grow after the merger at the same rates DVS has experienced in recent periods. Moreover, although its revenues have grown on an annual basis in recent years, DVS has experienced substantial quarter-to-quarter variations in levels of demand and revenue growth for its instruments and consumables, and we expect that these variances may continue in the future. Additional risks and uncertainties that could cause actual results to differ materially from currently anticipated results include, but are not limited to, risks relating to our ability to successfully integrate DVS; our ability to commercialize DVS products; market acceptance of DVS products; our ability to successfully launch new products and applications in DVS’s target markets; competition; our sales, marketing and distribution capabilities; our planned sales, marketing, and research and development activities; reduction in research and development spending or changes in budget priorities by customers; interruptions or delays in the supply of components or materials for, or manufacturing of, DVS’s products, which in certain cases are purchased through sole and single source suppliers; seasonal variations in customer operations; unanticipated increases in costs or expenses; risks associated with international operations; and the other risks identified in this

prospectus and the documents incorporated by reference in this prospectus. Our actual financial condition and results of operations following the DVS acquisition may not be consistent with, or evident from, the guidance we provide. Other unknown or unpredictable factors also could harm our results. Consequently, actual results or developments anticipated

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by us may not be realized or, even if substantially realized, may not have the expected consequences to, or effects on, us. Any failure to meet such guidance could have a material adverse effect on the trading price or volume of our stock.
Any failure to successfully integrate DVS's business and operations or fully realize potential synergies from the acquisition in the expected time frame would adversely affect our business, operating results, and financial condition.
We do not have a history of acquiring other companies, and the success of the DVS acquisition will depend, in part, on our ability to successfully integrate DVS's business and operations and fully realize the anticipated benefits and potential synergies from combining our business with DVS's business. To realize these anticipated benefits and potential synergies, we must successfully combine these businesses. If we are unable to achieve these objectives following the acquisition, the anticipated benefits and potential synergies from the acquisition may not be realized fully or at all, or may take longer to realize than expected. Any failure to timely realize these anticipated benefits would have a material adverse effect on our business, operating results, and financial condition.
We completed our acquisition of DVS in February 2014 and have only begun the integration process. In connection with the integration process, we could experience the loss of key employees, loss of key customers, decreases in revenues and increases in operating costs, as well as the disruption of our ongoing businesses, any or all of which could limit our ability to achieve the anticipated benefits and potential synergies from the acquisition and have a material adverse effect on our business, operating results, and financial condition.
DVS licenses core intellectual property rights covering its products under agreements with several third parties. Termination of or disputes relating to any of these license agreements would have a material adverse effect on our business, operating results, and financial condition and could result in our inability to sell DVS's flow cytometry products and otherwise to realize the benefits associated with the acquisition.
The intellectual property rights covering DVS's products depend in substantial part on license agreements with third parties, in particular MDS, Inc., or MDS, and also with other third parties such as Nodality, Inc., or Nodality. We understand that the licensed intellectual property rights of MDS as well as MDS's rights and obligations under the license agreement between DVS Sciences Inc., an Ontario corporation and wholly-owned subsidiary of DVS ("DVS Canada," which changed its name to Fluidigm Canada Inc. immediately subsequent to the acquisition of its parent company), and MDS were subsequently assigned to and are now held by PerkinElmer Health Sciences, Inc., or PerkinElmer. Under the PerkinElmer license agreement, DVS Canada received an exclusive, royalty bearing, worldwide license to certain patents that are now owned by PerkinElmer in the field of ICP-based flow cytometry, including the analysis of elemental tagged materials in connection therewith, and a non-exclusive license for reagents outside the field of ICP-based flow cytometry. DVS was also party to an interim license agreement, now expired, under which Nodality granted DVS a worldwide, non-exclusive, research use only, royalty bearing license to certain cytometric reagents, instruments, and other products. DVS and Nodality are currently in negotiations with respect to a license agreement that would have a term ending when the last licensed patent expires. In addition, DVS is party to additional in-license agreements with parties such as Stanford University that relate to significant intellectual property rights, and DVS's business and product development plans anticipate and will substantially depend on future in-license agreements with additional third parties, some of which are currently in the early discussion phase.
In-licensed intellectual property rights that are fundamental to the business being operated present numerous risks relating to ownership and enforcement of intellectual property rights. For example, under the PerkinElmer license, DVS is not granted any right, and we do not have any right to bring enforcement actions with respect to the patents licensed from PerkinElmer, which could materially impair our ability to preclude competitors and other third parties from activities that we consider to infringe on our exclusively licensed rights. In other cases such as with Nodality, all or a portion of the license rights granted may be limited for research use only, and in the event we attempt to expand into diagnostic applications, we would be required to negotiate additional rights, which may not be available to us on commercially reasonable terms, if at all.
In addition, DVS's licensors, including licensors of DVS Canada, may generally terminate the applicable license agreement for uncured material breaches or if DVS becomes insolvent, makes an assignment for the benefit of creditors, or has a petition in bankruptcy filed against it. In the case of Nodality, the existing license recently has expired and our acquisition of DVS acquisition could adversely affect DVS's ability to negotiate a definitive license on the currently anticipated terms. Termination of material license agreements for any reason, including as a result of

failure to obtain a required consent to assignment or as a result of an inability to negotiate a new or extended license where required, would result in a material loss of rights by us and DVS and would be expected to have a material adverse effect on our business, operating results, and financial condition. In particular, any such termination could prevent us from manufacturing and selling DVS's products unless we can negotiate new license terms or develop or acquire alternative intellectual property rights that cover or enable similar functionality. While we do not believe that any existing material in-license agreements require the consent of the licensor in order for us to rely on these licenses, the question is not free from doubt, and one or more of DVS's or DVS Canada's licensors, including PerkinElmer, could contend that the failure to obtain their consent constituted a breach or default under the applicable license agreement or require the negotiation of a new license. In the case of a dispute over these or other terms of the applicable

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license agreements with any of DVS's or DVS Canada's licensors, we cannot provide assurances that we will be able to negotiate a new or amended license on commercially reasonable terms, if at all. Any dispute between us and one of DVS's or DVS Canada's existing licensors concerning the terms or conditions of the applicable license agreement, including with respect to its continued application following the acquisition, could result, among other risks, in substantial management distraction at a time when our management would need to focus on the integration of Fluidigm and DVS; increased expenses associated with litigation or efforts to resolve disputes; substantial customer uncertainty concerning the direction of the combined companies' business; potential infringement claims against us and/or our customers, which could include efforts by a licensor to enjoin sales of DVS or DVS Canada's products; customer requests for indemnification by Fluidigm; and, in the event of an adverse determination, our inability to operate the business of DVS as currently operated or at all. Any of these factors would be expected to have a material adverse effect on our business, operating results, and financial condition and could result in a substantial decline in our stock price.

We cannot provide assurances that existing provisional application filings by DVS will result in issued patents or that any issued patents filed by DVS or its licensors will protect DVS's technology.

DVS has sought patent protection in the United States and internationally for certain aspects of its technology through licensed intellectual property and owned intellectual property. A significant portion of DVS's owned patent portfolio is in the form of provisional application filings that would need to be converted to non-provisional U.S. patent applications or international patent applications. We cannot be sure that patents will be granted with respect to any of DVS's owned or licensed pending patent applications or with respect to any patent applications filed by DVS or its licensors in the future, nor can we be sure that any of DVS's existing owned or licensed patents or any patents that may be granted to DVS or its licensors in the future will protect such technology. For aspects of DVS's technology for which patent protection may not be available, it has relied on protection through trade secrets, know-how, or continuing technological innovation.

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

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

We have made certain assumptions relating to the DVS acquisition which may prove to be materially inaccurate.

We have made certain assumptions relating to the DVS acquisition, which assumptions may be inaccurate, including as the result of the failure to realize the expected benefits of the DVS acquisition, failure to realize expected revenue

growth rates, higher than expected operating, transaction and integration costs, as well as general economic and business conditions that adversely affect the combined company following the DVS acquisition. These assumptions relate to numerous matters, including:

- projections of DVS's revenue growth rates and future revenues;
- our expected capital structure after the DVS acquisition;
- the amount of goodwill and intangibles that will result from the DVS acquisition;

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- certain other purchase accounting adjustments that we expect will be recorded in our financial statements in connection with the DVS acquisition;
- acquisition costs, including restructuring charges and transaction costs;
- our ability to maintain, develop and deepen relationships with customers of DVS; and
- other financial and strategic risks of the DVS acquisition.

We and DVS may have difficulty attracting, motivating and retaining executives and other key employees in light of the acquisition.

Uncertainty about the effect of the acquisition on our and DVS's employees may have an adverse effect on us or DVS and, consequently, the combined business resulting from the acquisition. This uncertainty may impair our and DVS's ability to attract, retain and motivate key personnel in the months after the merger for the combined entity. Employee retention may be particularly challenging as our and DVS's employees may experience uncertainty about their future roles with the combined business. Additionally, as a result of the acquisition, key employees became entitled to receive a portion of the acquisition consideration, the payment of which could provide sufficient financial incentive for certain officers and employees to no longer pursue employment with the combined business. In particular, we have identified several key employees, including key scientific and technical employees, who have been important to the development of DVS's products and technologies, and we have implemented employment compensation arrangements in connection with the acquisition to ensure these individuals' continued employment with us. We cannot provide assurances that these arrangements will sufficiently incentivize these key employees to remain with Fluidigm or DVS after the acquisition. If key employees depart because of issues relating to the uncertainty and difficulty of integration, financial incentives or a desire not to become employees of the combined business, we may incur significant costs in identifying, hiring and retaining replacements for departing employees, which could substantially reduce or delay our ability to realize the anticipated benefits of the acquisition.

Our and DVS's business relationships, including customer relationships, may be subject to disruption due to uncertainty associated with the acquisition.

Parties with which we or DVS do business may experience uncertainty associated with the acquisition, including with respect to current or future business relationships with us, DVS, or the combined business. These business relationships may be subject to disruption as customers and others may attempt to negotiate changes in existing business relationships or consider entering into business relationships with parties other than us, DVS, or the combined business, including our competitors or those of DVS. These disruptions could have a material adverse effect on the businesses, operating results, and financial condition of the combined business.

DVS or its employees may be subject to damages resulting from claims that it or its employees wrongfully used or disclosed alleged trade secrets of former employers of DVS employees or other institutions or third parties with whom DVS employees may have been previously affiliated.

Many of DVS's employees, including its founders, were previously employed at universities or other life science companies, including current or potential competitors of DVS or Fluidigm. Although no litigation against DVS is currently pending, DVS has in the past received notices from third parties alleging potential disclosures of confidential information. As a result, we could become subject to claims that DVS employees inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers or other third parties or institutions with whom DVS employees may have been previously affiliated. Litigation may be necessary to defend against these claims. If we fail in defending such claims, in addition to paying monetary damages, we may lose intellectual property rights of DVS. A loss of key work product of DVS personnel could hamper or prevent our ability to commercialize certain potential products, which could severely harm DVS's business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management.

We will incur significant acquisition-related integration costs in connection with the acquisition.

We have developed a plan to integrate the operations of DVS with our business. In connection with that plan, we anticipate that we will incur certain non-recurring charges in connection with this integration; however, we cannot identify the timing, nature and amount of all such charges as of the date of this report. Further, we incurred significant transaction costs relating to negotiating and completing the acquisition. These integration costs and transaction

expenses will be charged as an expense in the period incurred. The significant transaction costs and acquisition-related integration costs could materially affect our results of operations in the period in which such charges are recorded. Although we believe that the elimination of duplicative costs, as well as the realization of other efficiencies related to the integration of the business, will offset incremental transaction and acquisition-related costs over time, this net benefit may not be achieved in the near term, or at all.

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The stated value of long-lived and intangible assets may become impaired and result in an impairment charge. As of September 30, 2013, after giving pro forma effect to the DVS acquisition, we would have had approximately $235 million of intangible assets and goodwill on a pro forma combined basis, all of which relates to the acquisition of DVS. In addition, if in the future we acquire additional complementary businesses or technologies, a substantial portion of the value of such assets may be recorded as intangible assets or goodwill. The carrying amounts of intangible assets and goodwill are affected whenever events or changes in circumstances indicate that the carrying amount of any asset may not be recoverable. Such events or changes might include a significant decline in market share, a significant decline in revenues, a significant increase in losses or decrease in profits, rapid changes in technology, failure to achieve the benefits of capacity increases and utilization, significant litigation arising out of an acquisition or other matters. Adverse events or changes in circumstances may affect the estimated undiscounted future operating cash flows expected to be derived from intangible assets and goodwill. If at any time we determine that an impairment has occurred, we will be required to reflect the impaired value as a charge, resulting in a reduction in earnings in the quarter such impairment is identified and a corresponding reduction in our net asset value. The potential recognition of impairment in the carrying value, if any, could have a material and adverse effect on our financial condition and results of operations.

Risks Related to Intellectual Property

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

Our commercial success depends in part on our ability to protect our intellectual property and proprietary technologies. We rely on patent protection, where appropriate and available, as well as a combination of copyright, trade secret, and trademark laws, and nondisclosure, confidentiality, and other contractual restrictions to protect our proprietary technology. However, these legal means afford only limited protection and may not adequately protect our rights or permit us to gain or keep any competitive advantage. We apply for patents covering our products and technologies and uses thereof, as we deem appropriate. However, we may fail to apply for patents on important products and technologies in a timely fashion or at all. Our pending U.S. and foreign patent applications may not issue as patents or may not issue in a form that will be sufficient to protect our proprietary technology and gain or keep our competitive advantage. Any patents we have obtained or do obtain may be subject to re-examination, reissue, opposition, or other administrative proceeding, or may be challenged in litigation, and such challenges could result in a determination that the patent is invalid or unenforceable. In addition, competitors may be able to design alternative methods or devices that avoid infringement of our patents. Both the patent application process and the process of managing patent disputes can be time consuming and expensive.

Furthermore, the laws of some foreign countries may not protect our intellectual property rights to the same extent as do the laws of the United States, and many companies have encountered significant problems in protecting and defending such rights in foreign jurisdictions. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial cost and divert our efforts and attention from other aspects of our business. Changes in either the patent laws or in interpretations of patent laws in the United States or other countries may diminish the value of our intellectual property. We cannot predict the breadth of claims that may be allowed or enforced in our patents or in third-party patents. For example:

- We might not have been the first to make the inventions covered by each of our pending patent applications;
- We might not have been the first to file patent applications for these inventions;
- The patents of others may have an adverse effect on our business; and
- Others may independently develop similar or alternative products and technologies or duplicate any of our products and technologies.

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

We may be involved in lawsuits to protect or enforce our patents and proprietary rights, to determine the scope, coverage and validity of others' proprietary rights, or to defend against third party claims of intellectual property infringement, any of which could be time-intensive and costly and may adversely impact our business or stock price.

Litigation may be necessary for us to enforce our patent and proprietary rights, determine the scope, coverage, and validity of others' proprietary rights, and/or defend against third party claims of intellectual property infringement against us as well as against our suppliers, distributors, customers, and other entities with whom we do business. Litigation could result in substantial legal fees and could adversely affect the scope of our patent protection. The outcome of any litigation or other proceeding is inherently uncertain and might not be favorable to us, and we might not be able to obtain licenses to technology that we require. Even if such licenses are obtainable, they may not be available at a reasonable cost. We could therefore incur substantial costs related to royalty payments for licenses obtained from third parties, which could negatively affect our gross

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margins or financial position. Further, we could encounter delays in product introductions, or interruptions in product sales, as we develop alternative methods or products.

As we move into new markets and applications for our products, incumbent participants in such markets may assert their patents and other proprietary rights against us as a means of impeding our entry into such markets or as a means to extract substantial license and royalty payments from us. Our commercial success may depend in part on our non-infringement of the patents or proprietary rights of third parties. Numerous significant intellectual property issues have been litigated, and will likely continue to be litigated, between existing and new participants in our existing and targeted markets. For example, some of our products provide for the testing and analysis of genetic material, and patent rights relating to genetic materials remain a developing area of patent law. A recent U.S. Supreme Court decision held, among other things, that claims to isolated genomic DNA occurring in nature are not patent eligible, while claims relating to synthetic DNA may be patent eligible. We expect the ruling will result in additional litigation in our industry. In addition, third parties may assert that we are employing their proprietary technology without authorization. For example, on June 4, 2008 we received a letter from Applied Biosystems, Inc., a wholly-owned subsidiary of Life Technologies Corporation (now part of Thermo Fisher Scientific and collectively referred to as Life), asserting that our BioMark System for gene expression analysis infringes upon U.S. Patent No. 6,814,934, or the ‘934 patent, and its foreign counterparts in Europe and Canada. In June 2011, we resolved this dispute by entering into license agreements with Life which, among other matters, granted us a non-exclusive license to the ‘934 patent and its foreign counterparts.

Our customers have been sued for various claims of intellectual property infringement in the past, and we expect that our customers will be involved in additional litigation in the future. In particular, our customers may become subject to lawsuits claiming that their use of our products infringes third-party patent rights, and we could become subject to claims that we contributed to or induced our customer’s infringement. In addition, our agreements with some of our suppliers, distributors, customers, and other entities with whom we do business may require us to defend or indemnify these parties to the extent they become involved in infringement claims against us, including the claims described above. We could also voluntarily agree to defend or indemnify third parties in instances where we are not obligated to do so if we determine it would be important to our business relationships. If we are required or agree to defend or indemnify any of these third parties in connection with any infringement claims, we could incur significant costs and expenses that could adversely affect our business, operating results, or financial condition.

We depend on certain technologies that are licensed to us. We do not control these technologies and any loss of our rights to them could prevent us from selling our products, which would have an adverse effect on our business.

We rely on licenses in order to be able to use various proprietary technologies that are material to our business, including our core IFC and multi-layer soft lithography technologies. In some cases, we do not control the prosecution, maintenance, or filing of the patents to which we hold licenses, or the enforcement of these patents against third parties.

Our rights to use the technology we license are subject to the negotiation and continuation of those licenses. Certain of our licenses contain provisions that allow the licensor to terminate the license upon specific conditions. Our rights under the licenses are subject to our continued compliance with the terms of the license, including the payment of royalties due under the license. Because of the complexity of our products and the patents we have licensed, determining the scope of the license and related royalty obligation can be difficult and can lead to disputes between us and the licensor. An unfavorable resolution of such a dispute could lead to an increase in the royalties payable pursuant to the license. If a licensor believed we were not paying the royalties due under the license or were otherwise not in compliance with the terms of the license, the licensor might attempt to revoke the license. If such an attempt were successful and the license is terminated, we might be barred from marketing, producing, and selling some or all of our products, which would have an adverse effect on our business. For example, pursuant to the terms of a license agreement entered into with Life in June 2011, we were obligated to make a $1.0 million payment to Life upon satisfaction of certain conditions. On October 16, 2013, Life provided notice that the $1.0 million payment was due and payable under the license agreement. We believe that at least one of the conditions of the milestone payment remains unmet; however, we paid Life the amount due while reserving our rights with respect to such matter to, among other reasons, avoid what would have been, in our view, an improper termination of our license to certain Life

patent filings under the agreement, which could have subject our relevant product lines to risks associated with patent infringement litigation.

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

We are subject to certain U.S. government regulations because we have licensed technologies that were developed with U.S. government grants. In accordance with these regulations, these licenses provide that products embodying the technologies are subject to domestic manufacturing requirements. If this domestic manufacturing requirement is not met, the government agency that funded the relevant grant is entitled to exercise specified rights, referred to as “march-in rights,” which if exercised

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

We may be subject to damages resulting from claims that we or our employees have wrongfully used or disclosed alleged trade secrets of our employees' former employers.

Many of our employees were previously employed at universities or other life science or Ag-Bio companies, including our competitors or potential competitors. Although no claims against us are currently pending, we may be subject to claims that these employees or we have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers. Litigation may be necessary to defend against these claims. If we fail in defending such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights. A loss of key research personnel work product could hamper or prevent our ability to commercialize certain potential products, which could severely harm our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management.

Risks Related to Our Common Stock

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

Our stock is currently traded on NASDAQ, but we can provide no assurance that we will be able to maintain an active trading market on NASDAQ or any other exchange in the future. The trading volume of our stock tends to be low relative to our total outstanding shares, and we have several stockholders, including affiliated stockholders, who hold substantial blocks of our stock. As of December 31, 2013, we had 25,810,890 shares of common stock outstanding, and stockholders holding at least 5% of our stock, individually or with affiliated persons or entities, collectively beneficially owned or controlled approximately 55% of such shares. Sales of large numbers of shares by any of our large stockholders could adversely affect our trading price, particularly given our relatively small historic trading volumes. If stockholders holding shares of our common stock sell, indicate an intention to sell, or if it is perceived that they will sell, substantial amounts of their common stock in the public market, the trading price of our common stock could decline. Moreover, if there is no active trading market or if the volume of trading is limited, holders of our common stock may have difficulty selling their shares.

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

- actual or anticipated quarterly variation in our results of operations or the results of our competitors;
- announcements or communications by us or our competitors relating to, among other things, new commercial products, technological advances, significant contracts, commercial relationships, capital commitments, acquisitions or sales of businesses, and/or misperceptions in or speculation by the market regarding such announcements or communications;
- issuance of new or changed securities analysts' reports or recommendations for our stock;

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- developments or disputes concerning our intellectual property or other proprietary rights;
- commencement of, or our involvement in, litigation;
- market conditions in the life science, Ag-Bio, and clinical research sectors;
- failure to complete significant sales;
- manufacturing disruptions that could occur if we were unable to successfully expand our production in our current or an alternative facility;
- any future sales of our common stock or other securities in connection with raising additional capital or otherwise;
- any major change to the composition of our board of directors or management; and
- general economic conditions and slow or negative growth of our markets.

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

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

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

Our directors, executive officers, and large stockholders have substantial control over and could limit your ability to influence the outcome of key transactions, including changes of control.

As of December 31, 2013, our current executive officers, directors, stockholders holding at least 5% of our outstanding stock, and their respective affiliates, collectively beneficially owned or controlled approximately 56% of the outstanding shares of our common stock. Accordingly, these executive officers, directors, large stockholders, and their respective affiliates, acting as a group, can have substantial influence over the outcome of corporate actions requiring stockholder approval, including the election of directors, any merger, consolidation or sale of all or substantially all of our assets, or any other significant corporate transactions. These stockholders may also delay or prevent a change of control of us, even if such a change of control would benefit our other stockholders. The significant concentration of stock ownership may adversely affect the trading price of our common stock due to investors' perception that conflicts of interest may exist or arise.

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

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

- authorize our board of directors to issue, without further action by the stockholders, up to 10,000,000 shares of undesignated preferred stock;
- require that any action to be taken by our stockholders be effected at a duly called annual or special meeting and not by written consent;
- specify that special meetings of our stockholders can be called only by our board of directors, the chairman of the board, the chief executive officer or the president;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our board of directors;

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- establish that our board of directors is divided into three classes, Class I, Class II, and Class III, with each class serving staggered three year terms;
- provide that our directors may be removed only for cause;
- provide that vacancies on our board of directors may be filled only by a majority of directors then in office, even though less than a quorum;
- specify that no stockholder is permitted to cumulate votes at any election of directors; and
- require a super-majority of votes to amend certain of the above-mentioned provisions.

These provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors, which is responsible for appointing the members of our management. In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which limits the ability of stockholders owning in excess of 15% of our outstanding voting stock to merge or combine with us.

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

We have paid no cash dividends on any of our classes of capital stock to date, have contractual restrictions against paying cash dividends, and currently intend to retain our future earnings to fund the development and growth of our business. As a result, capital appreciation, if any, of our common stock will be stockholders' sole source of gain for the foreseeable future.

Risks Related to Our Outstanding 2.75% Senior Convertible Notes due 2034

Our outstanding 2.75% senior convertible notes due 2034 are effectively subordinated to our secured debt and any liabilities of our subsidiaries.

Our outstanding 2.75% senior convertible notes due 2034, which we refer to as our "notes" rank:

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

In February 2014, we completed our offering of notes with an aggregate outstanding principal amount of $201.3 million. In the event of our bankruptcy, liquidation, reorganization or other winding up, our assets that secure debt ranking senior in right of payment to the notes will be available to pay obligations on the notes only after the secured debt has been repaid in full from these assets, and the assets of our subsidiaries will be available to pay obligations on the notes only after all claims senior to the notes have been repaid in full. There may not be sufficient assets remaining to pay amounts due on any or all of the notes then outstanding. The indenture governing the notes does not prohibit us from incurring additional senior debt or secured debt, nor does it prohibit our subsidiaries from incurring additional liabilities.

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

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

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

We expect that many investors in, and potential purchasers of, the notes will employ, or seek to employ, a convertible arbitrage strategy with respect to the notes. Investors would typically implement such a strategy by selling short the common stock underlying the notes and dynamically adjusting their short position while continuing to hold the notes.

Investors may also implement this type of strategy by entering into swaps on our common stock in lieu of or in addition to short selling the

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

The SEC and other regulatory and self-regulatory authorities have implemented various rules and taken certain actions, and may in the future adopt additional rules and take other actions, that may impact those engaging in short selling activity involving equity securities (including our common stock). Such rules and actions include Rule 201 of SEC Regulation SHO, the adoption by the Financial Industry Regulatory Authority, Inc. and the national securities exchanges of a "Limit Up-Limit Down" program, the imposition of market-wide circuit breakers that halt trading of securities for certain periods following specific market declines, and the implementation of certain regulatory reforms required by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. Although the direction and magnitude of the effect that Regulation SHO, FINRA, securities exchange rule changes and implementation of the Dodd-Frank Act may have on the trading price and the liquidity of the notes will depend on a variety of factors, many of which cannot be determined at the date of the prospectus, past regulatory actions (such as certain emergency orders issued by the SEC in 2008 prohibiting short sales of stock of certain financial services companies) have had a significant impact on the trading prices and liquidity of convertible debt instruments. Any governmental or regulatory action that restricts the ability of investors in, or potential purchasers of, the notes to effect short sales of our common stock, borrow our common stock or enter into swaps on our common stock or increases the costs of implementing an arbitrage strategy could adversely affect the trading price and the liquidity of the notes.

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

The stock market in recent years has experienced significant price and volume fluctuations that have often been unrelated to the operating performance of companies. The market price of our common stock could fluctuate significantly for many reasons, including in response to the risks described in this section, elsewhere in this prospectus and the documents we have incorporated by reference herein, or for reasons unrelated to our operations, such as reports by industry analysts, investor perceptions or negative announcements by our customers, competitors or suppliers regarding their own performance, as well as industry conditions and general financial, economic and political instability. A decrease in the market price of our common stock would likely adversely impact the trading price of the notes. The market price of our common stock could also be affected by possible sales of our common stock by investors who view the notes as a more attractive means of equity participation in us and by hedging or arbitrage trading activity that we expect to develop involving our common stock. This trading activity could, in turn, affect the trading price of the notes.

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

We currently have a financing arrangement pursuant to which we may incur up to $10 million of revolver borrowings and our subsidiaries may be able to incur substantial additional debt, subject to the restrictions contained in such arrangement or our future debt instruments, some of which may be secured debt. We are not restricted under the terms of the indenture governing the notes from incurring additional debt, securing existing or future debt, recapitalizing our debt or taking a number of other actions that are not limited by the terms of the indenture governing the notes that could have the effect of diminishing our ability to make payments on the notes when due. Any failure by us or any of our significant subsidiaries to make any payment at maturity of indebtedness for borrowed money in excess of $15 million or the acceleration of any such indebtedness in excess of $15 million would, subject to the terms of the indenture governing the notes, constitute a default under the indenture. If the repayment of the related indebtedness were to be accelerated after any applicable notice or grace periods, we may not have sufficient funds to repay the notes when required.

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

Holders of the notes have the right to require us to repurchase all or a portion of their notes on certain dates or upon the occurrence of a fundamental change at a repurchase price equal to 100% of the principal amount of the notes to be

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

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

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Future sales of our common stock in the public market could cause our stock price to decline and adversely impact the trading price of the notes.

In the future, we may sell additional shares of our common stock to raise capital. The market price of our common stock could decline as a result of sales of a large number of shares of our common stock in the market, particularly sales by our directors, executive officers, employees, and significant stockholders, and the perception that these sales could occur may also depress the market price of our common stock and the trading price of the notes. As of December 31, 2013, we had 25,810,890 shares of common stock outstanding.

Substantial sales of our common stock may make it more difficult for us to sell equity or equity-linked securities in the future at a time and at a price that we deem appropriate. These sales also could cause our stock price and the trading price of the notes to fall and make it more difficult for holders of the notes or the shares of our common stock received upon conversion of the notes.

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

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

We have made only limited covenants in the indenture governing the notes, and these limited covenants may not protect your investment.

The indenture governing the notes does not:

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

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

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

If a make-whole fundamental change occurs prior to February 6, 2021 or upon our issuance of a notice of provisional redemption, under certain circumstances, we will increase the conversion rate by a number of additional shares of our common stock for notes converted in connection such events. The increase in the conversion rate for notes converted in connection with such events may not adequately compensate you for any lost value of your notes as a result of such transaction or redemption. In addition, if the price of our common stock in the transaction is greater than $180.00 per

share or less than $39.96 per share

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(in each case, subject to adjustment), no additional shares will be added to the conversion rate. Moreover, in no event will the conversion rate per $1,000 principal amount of notes as a result of this adjustment exceed 25.0250 shares of common stock, subject to adjustment.

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

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

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

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

Upon the occurrence of a fundamental change, a holder of notes has the right to require us to repurchase the notes. However, the fundamental change provisions will not afford protection to holders of notes in the event of other transactions that could adversely affect the notes. For example, transactions such as leveraged recapitalizations, refinancings, restructurings, or acquisitions initiated by us may not constitute a fundamental change requiring us to repurchase the notes. In the event of any such transaction, the holders would not have the right to require us to repurchase the notes, even though each of these transactions could increase the amount of our indebtedness, or otherwise adversely affect our capital structure or any credit ratings, thereby adversely affecting the holders of notes. In addition, absent the occurrence of a fundamental change or a make-whole fundamental change as described under changes in the composition of our board of directors will not provide holders with the right to require us to repurchase the notes or to an increase in the conversion rate upon conversion.

We cannot assure you that an active trading market will develop for the notes.

There has historically been no trading market for the notes, and we do not intend to apply to list the notes on any securities exchange or to arrange for quotation on any automated dealer quotation system. In addition, the liquidity of the trading market in the notes and the market price quoted for the notes may be adversely affected by changes in the overall market for this type of security and by changes in our financial performance or prospects or in the prospects for companies in our industry generally. As a result, we cannot assure you that an active trading market will develop for the notes. If an active trading market does not develop or is not maintained, the market price and liquidity of the notes may be adversely affected. In that case you may not be able to sell your notes at a particular time or you may not be able to sell your notes at a favorable price.

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

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

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

The conversion rate of the notes is subject to adjustment in certain circumstances, including the payment of cash dividends. If the conversion rate is adjusted as a result of a distribution that is taxable to our common stockholders, such as a cash dividend, you may be deemed to have received a dividend subject to U.S. federal income tax without the receipt of any cash. In addition, a failure to adjust (or to adjust adequately) the conversion rate after an event that increases your proportionate interest in us could be treated as a deemed taxable dividend to you. If a make-whole fundamental change occurs prior to February 6, 2021 or we provide notice of a provisional redemption, under some circumstances, we will increase the conversion rate for notes converted in connection with the make-whole

fundamental change or provisional redemption. Such increase may also be treated as a distribution subject to U.S. federal income tax as a dividend. For a non-U.S. holder, any deemed dividend would be subject to U.S. federal withholding tax at a 30% rate, or such lower rate as may be specified by an applicable treaty, which may be set off against subsequent payments on the notes.

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

Any conversion of some or all of the notes will dilute the ownership interests of our existing stockholders. Any sales in the public market of our common stock issuable upon such conversion could adversely affect prevailing market prices of our common stock. In addition, the existence of the notes may encourage short selling by market participants because the conversion of the notes could depress the price of our common stock.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

We lease approximately 48,000 square feet of office and laboratory space at our headquarters in South San Francisco, California under a lease that expires in April 2020. The leases for approximately 28,000 square feet of manufacturing and office space at our current facility in Singapore will terminate on September 30, 2014. Additionally, we have entered into a lease for a new manufacturing facility in Singapore, which expires on June 1, 2022, and we expect to consolidate our manufacturing operations in the new space in the third quarter of 2014. As of December 31, 2013, we also leased office space in Japan, China, and France, with various expiration dates through March 2016. We believe that our existing office, laboratory and manufacturing space, together with additional space and facilities under our new Singapore lease and otherwise available on commercially reasonable terms, will be sufficient to meet our needs through 2016. In addition, we believe that our properties are in good condition and are adequate and suitable for their purposes.

ITEM 3. LEGAL PROCEEDINGS

On November 6, 2012, we filed a complaint against NanoString Technologies, Inc., or NanoString, in the United States District Court in the Northern District of California (Civil Action No. 12-5712), alleging claims of false advertising, unfair competition, and unlawful trade practice in violation of the Lanham Act and corresponding sections of the California Business & Professions Code. Our complaint sought to enjoin NanoString from continuing to make or disseminate any of the false and misleading claims, misrepresenting and/or exaggerating the performance of its product in comparison with our BioMark System, to require NanoString to retract, remove, or correct the false and misleading advertising claims, and to recover damages and other relief for harm caused to us by NanoString. On January 4, 2013, NanoString answered the complaint, denying the allegations against it. On April 22, 2013, we amended our complaint to add new facts and information in support of our existing claims. On May 9, 2013, NanoString filed an amended answer, denying the further allegations against it. The parties engaged in written discovery and document production, and a jury trial was set to begin on March 24, 2014. In addition, we filed a lawsuit on April 5, 2013 in Singapore against NanoString in the High Court of the Republic of Singapore (Case No. S 282/2013), alleging malicious falsehood in advertising and trademark infringement and sought relief similar to the relief sought in our complaint filed in the United States. On September 30, 2013, we and NanoString agreed to settle the lawsuits. The terms of the settlement require NanoString to, among other things, remove all references – from its marketing materials, website, and promotional activities – to a single-cell comparison study comparing Fluidigm and NanoString single-cell products, as well as recall and destroy all materials related to and/or based on the study. The case brought in the United States District Court in the Northern District of California was dismissed on October 22, 2013, and the case brought in Singapore was discontinued on October 29, 2013.

ITEM 4. MINE SAFETY DISCLOSURE

Not applicable.

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PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market for Our Common Stock; Dividends

Our common stock began trading on the NASDAQ Global Market under the symbol "FLDM" on February 10, 2011. The following table sets forth the range of high and low closing sales prices of our common stock for the periods indicated:

Year ended December 31, 2013	High	Low
First Quarter	$19.38	$14.27
Second Quarter	$19.04	$16.00
Third Quarter	$23.26	$16.59
Fourth Quarter	$39.37	$21.55
Year ended December 31, 2012	High	Low
First Quarter	$16.51	$12.60
Second Quarter	$15.75	$12.70
Third Quarter	$17.15	$12.80
Fourth Quarter	$17.10	$13.63

We had approximately 130 stockholders of record as of February 28, 2014; however, because many of our outstanding shares are held in accounts with brokers and other institutions, we believe we have more beneficial owners. We have never declared or paid dividends on our common stock and do not expect to pay dividends on our common stock for the foreseeable future. Instead, we anticipate that all of our earnings in the foreseeable future will be used for the operation and growth of our business.

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Stock Performance Graph

The following performance graph shall not be deemed "soliciting material" or to be "filed" with the Securities and Exchange Commission for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any filing of Fluidigm Corporation under the Securities Act or the Exchange Act.

The following graph shows a comparison from February 10, 2011 (the date our common stock commenced trading on the NASDAQ Global Market) through December 31, 2013 of cumulative total return for our common stock, the NASDAQ Composite Total Return Index, and the ICB Medical Equipment Index. Such returns are based on historical results and are not intended to suggest future performance. Data for the NASDAQ Composite Total Return Index, and the ICB Medical Equipment assume reinvestment of dividends.

Sales of Unregistered Securities

None.

Use of Proceeds

On February 9, 2011, our registration statement on Form S-1 (File No. 333-170965) was declared effective for the initial public offering of our common stock, or IPO. Through December 31, 2013, the net proceeds from our IPO have been applied as follows: $5.0 million for the repayment of promissory notes issued in January 2011, $5.0 million for the repayment of our bank line of credit, $44.3 million for research and development expenses, $10.2 million for general corporate purposes including selling, general and administrative expenses, and litigation settlement expense, and $7.5 million for capital expenditures. On June 30, 2011, we paid $3.0 million in connection with the settlement of certain patent litigation with Life Technologies Corporation (now part of Thermo Fisher Scientific), or Life. In July 2011, we paid Life an additional $2.0 million in connection with our exercise of an option under the terms of our agreements with Life to limit or preclude certain patent litigation between the parties over a period of two to four years. Other than the aggregate payment of $5.0 million to Life, there has been no material change in the planned use of proceeds from our IPO from that described in the final prospectus filed with the SEC pursuant to Rule 424(b) on February 10, 2011.

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ITEM 6. SELECTED FINANCIAL DATA

The following selected financial data should be read in conjunction with the consolidated financial statements and related notes thereto appearing elsewhere in this Form 10-K. We have derived the consolidated statement of operations data for the years ended December 31, 2013, 2012, and 2011 and consolidated balance sheet data as of December 31, 2013 and 2012 from audited consolidated financial statements included elsewhere in this Form 10-K. The consolidated statement of operations data for the fiscal years ended December 31, 2010 and December 31, 2009 and the consolidated balance sheet data as of December 31, 2011, December 31, 2010, and December 31, 2009 were derived from audited consolidated financial statements that are not included in this Form 10-K.

	Year Ended December 31, 2013	December 31, 2012	December 31, 2011	December 31, 2010	December 31, 2009
	(in thousands, except per share amounts)				
Consolidated Statement of Operations Data:					
Total revenue	$71,183	$ 52,334	$ 42,865	$ 33,560	$ 25,412
Loss from operations	(18,653)	(18,071)	(18,566)	(14,573)	(18,037)
Net loss attributed to common stockholders	(16,526)	(19,024)	(32,370)	(16,902)	(19,128)
Net loss per share attributed to common stockholders, basic and diluted	(0.65)	(0.86)	(1.81)	(8.94)	(11.02)
Consolidated Balance Sheet Data:					
Cash, cash equivalents, and short and long-term investments	$86,286	$ 83,677	$ 54,967	$ 5,723	$ 14,602
Working capital	89,354	91,500	51,873	3,705	22,112
Total assets	116,915	113,732	79,326	24,801	32,153
Total long-term debt	—	—	10,138	14,700	14,461
Convertible preferred stock	—	—	—	184,550	183,845
Total stockholders' equity (deficit)	96,414	100,657	56,897	(189,167)	(173,619)

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ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis should be read together with our consolidated financial statements and the notes to those statements included elsewhere in this Form 10-K. This discussion contains forward-looking statements based on our current expectations, assumptions, estimates and projections about Fluidigm and our industry. These forward-looking statements involve risks and uncertainties. Our actual results could differ materially from those indicated in these forward-looking statements as a result of certain factors, as more fully described in "Risk factors" in Item 1A of this Form 10-K, in this Item 7, and elsewhere in this Form 10-K. Except as may be required by law, we undertake no obligation to update publicly any forward-looking statements for any reason, even if new information becomes available or other events occur in the future.

On February 13, 2014, we completed the acquisition of DVS Sciences, Inc., or DVS, which develops, manufactures, markets, and sells multi-parameter single-cell protein analysis systems. The information set forth in the following discussion and analysis relates principally to our business of manufacturing, marketing, and selling microfluidic systems for single-cell genomics, applied genotyping, and sample preparation for targeted resequencing. For information relating to the acquisition of DVS and DVS's business, please refer to the sections entitled "Business—Recent Developments—Acquisition of DVS Sciences, Inc." and "—Business of DVS."

Overview

We develop, manufacture, and market microfluidic systems to academic institutions, clinical laboratories, and pharmaceutical, biotechnology, and agricultural biotechnology (Ag-Bio) companies in growth markets, such as single-cell genomics, applied genotyping, and sample preparation for targeted resequencing. Our proprietary microfluidic systems consist of instruments and consumables, including integrated fluidic circuits (IFCs), assays, and reagents. We actively market four microfluidic systems, including 18 different commercial IFCs, and three families of assay chemistries. Our systems are designed to significantly simplify experimental workflow, increase throughput, and reduce costs, while providing excellent data quality. In addition, our proprietary technology enables genetic analysis that in many instances was previously impractical. As of December 31, 2013, we sold approximately 920 systems to customers in 35 countries worldwide.

We have launched several product lines, including our BioMark System for gene expression analysis, genotyping, and digital polymerase chain reaction, or digital PCR, in 2006; our EP1 System for single nucleotide polymorphism, or SNP, genotyping, and digital PCR in 2008; our Access Array System for target enrichment in 2009; our BioMark HD System for high-throughput gene expression analysis, single-cell targeted gene expression analysis, SNP genotyping, and digital PCR in 2011; and our C_1 Single-Cell Auto Prep System for single cell sample preparation in June 2012. In addition, in May 2011, we launched assay products, including our DELTAgene assays for gene expression; our SNPtype assays for SNP genotyping; and our Access Array Target-Specific primers for targeted next-generation DNA sequencing. Our systems utilize one or more IFCs designed for particular applications and include specialized instrumentation and software, as well as assays and other reagents for certain applications.

We distribute our microfluidic systems through our direct sales force and support organizations located in North America, Europe, and Asia-Pacific, and through distributors or sales agents in several European, Latin American, Middle Eastern, and Asia-Pacific countries. Our manufacturing operations are primarily located in Singapore. Our facility in Singapore manufactures our instruments, several of which are assembled at facilities of our contract manufacturers in Singapore, with testing and calibration of the assembled products performed at our Singapore facility. All of our IFCs for commercial sale and some IFCs for our research and development purposes are fabricated at our Singapore facility. Our South San Francisco facility fabricates IFCs for our research and development purposes, and manufactures our assays and produces other reagents for commercial sale.

Our total revenue grew from $42.9 million in 2011 to $71.2 million in 2013. We have incurred significant net losses since our inception in 1999 and, as of December 31, 2013, our accumulated deficit was $257.3 million.

Critical Accounting Policies, Significant Judgments and Estimates

Our consolidated financial statements and the related notes included elsewhere in this Form 10-K are prepared in accordance with accounting principles generally accepted in the United States. The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets,

liabilities, revenue, costs, and expenses and related disclosures. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances. Changes in accounting estimates may occur from period to period. Accordingly, actual results could differ significantly from the estimates made by our management. We evaluate our estimates and assumptions on an ongoing basis. To the extent that there are material differences between these estimates and actual results, our future financial statement presentation, financial condition, results of operations, and cash flows will be affected.

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We believe that the following critical accounting policies involve a greater degree of judgment and complexity than our other accounting policies. Accordingly, these are the policies we believe are the most critical to understanding and evaluating our consolidated financial condition and results of operations. Our accounting policies are more fully described in Note 2 of the notes to our audited consolidated financial statements.

Revenue Recognition

We generate revenue from sales of our products, license and collaboration arrangements, and government grants. Our product revenue consists of sales of instruments and related services, and consumables, including IFCs, assays, and other reagents.

We recognize revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price to the customer is fixed or determinable, and collectability is reasonably assured. Revenue from the sales of our products that are not part of multiple element arrangements are recognized when no significant obligation remains undelivered and collection is reasonably assured, which is generally when delivery has occurred. Delivery occurs when there is a transfer of title and risk of loss passes to the customer. Payments received in advance of revenue recognition are classified as deferred revenue in the consolidated balance sheet.

The evaluation of these revenue recognition criteria requires significant management judgment. For instance, we use judgment to assess collectability based on factors such as the customer's creditworthiness and past collection history, if applicable. If we determine that collection is not reasonably assured, revenue recognition is deferred until receipt of payment. We also use judgment to assess whether a price is fixed or determinable by, among other things, reviewing contractual terms and conditions related to payment.

Certain of our sales contracts involve the delivery of multiple products or services within contractually binding arrangements. Significant judgment is sometimes required to determine the appropriate accounting for such arrangements, including whether the deliverables specified in a multiple element arrangement should be treated as separate units of accounting for revenue recognition purposes and, if so, how the related sales price should be allocated among the elements, when to recognize revenue for each element, and the period over which revenue should be recognized.

For sales contracts that include multiple deliverables, we allocate the contract consideration at the inception of the contract to each unit of accounting based upon their relative selling prices. We may use our best estimate of selling price for individual deliverables when vendor specific objective evidence or third-party evidence is unavailable. A delivered item is considered to be a separate unit of accounting when it has value to the customer on a stand-alone basis.

Our products, other than for service contracts, are delivered within a short time frame, generally within one to three months, of the contract date. Service contracts are entered into for terms of one to three years, following the expiration of the warranty period.

Our products are sold without the right of return. Accruals are provided for estimated warranty expenses at the time the associated revenue is recognized. We use judgment to estimate these accruals and, if we were to experience an increase in warranty claims or if costs of servicing our products under warranty were greater than our estimates, our cost of product revenue could be adversely affected in future periods.

We have entered into license and collaboration agreements with third parties that generally provide us with up-front and periodic milestone payments. Revenue from license agreements is recognized when received, upfront payments are generally recognized over the term of the underlying agreement and milestone payments are generally recognized based upon the achievement of the milestones as defined in the agreement.

We receive grants from various governmental entities for research and related activities. Grants provide us with payments for certain types of research and development activities performed over a contractually defined period. Grant revenue is recognized in the period during which the related costs are incurred, provided that the conditions under which the grants were provided have been met and we have only perfunctory obligations outstanding. Amounts received in advance of revenue recognition are classified as deferred revenue in the consolidated balance sheets. Costs associated with grants are included in research and development expenses in the consolidated statements of operations.

Changes in judgments and estimates regarding application of these revenue recognition guidelines as well as changes in facts and circumstances could result in a change in the timing or amount of revenue recognized in future periods.

Stock-Based Compensation

We measure the cost of employee services received in exchange for an award of equity instruments, including stock options and restricted stock units, based on the grant date fair value of the award. The fair value of options on the grant date is

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estimated using the Black-Scholes option-pricing model, which requires the use of certain subjective assumptions, including expected term, volatility, risk-free interest rate and the fair value of our common stock. These assumptions generally require significant judgment.

Our board of directors sets the terms, conditions, and restrictions related to the grant of stock options and restricted stock units, including the number of shares underlying the grants and the vesting criteria. With respect to performance-based stock options, depending on the extent to which the vesting criteria are met, our board of directors determines the number of shares that vest under the grants.

The resulting costs of our equity awards, net of estimated forfeitures, are recognized over the period during which an employee is required to provide service in exchange for the award, usually a time-based vesting period. We amortize the fair value of stock-based compensation on a straight-line basis over the requisite service periods. For performance-based stock options, we recognize stock-based compensation over the requisite service periods using the accelerated attribution method.

Our common stock has a limited trading history because our common stock was not publicly traded until our initial public offering, or IPO, in February 2011. Accordingly, the expected volatility of our common stock is derived from the historical volatilities of several unrelated public companies within the life science industry. When selecting our industry peer companies, we consider our stage of development, size, and financial leverage. These historical volatilities are weighted based on certain qualitative factors and combined to produce a single volatility factor. The risk-free interest rate is based on the U.S. Treasury yield in effect at the time of grant for zero coupon U.S. Treasury notes with maturities approximately equal to each grant's expected life. We estimate the expected lives of employee options using the "simplified" method as the midpoint of the expected time-to-vest and the contractual term.

The calculated fair value of our stock options could change significantly if we determine that another method is more reasonable, or if another method for calculating these input assumptions is prescribed by authoritative guidance. Higher volatility and longer expected lives result in an increase in stock-based compensation expense determined at the date of grant. Stock-based compensation expense affects our cost of product revenue, research and development expense, and selling, general and administrative expense.

We estimate our forfeiture rate based on an analysis of our actual forfeitures and we will continue to evaluate the appropriateness of the forfeiture rate based on actual forfeiture experience, analysis of employee turnover behavior, and other factors. Quarterly changes in the estimated forfeiture rate can have a significant effect on reported stock-based compensation expense, as the cumulative effect of adjusting the rate is recognized in the period the forfeiture estimate is changed. If a revised forfeiture rate is higher than the previously estimated forfeiture rate, an adjustment is made that will result in a decrease to the stock-based compensation expense recognized in the consolidated financial statements. If a revised forfeiture rate is lower than the previously estimated forfeiture rate, an adjustment is made that will result in an increase to the stock-based compensation expense recognized in the consolidated financial statements. The effect of forfeiture adjustments was insignificant during 2013, 2012, and 2011. We will continue to use judgment in evaluating the expected term, volatility, and forfeiture rate related to our stock-based compensation.

Also required to compute the fair value calculation of options is the fair value of the underlying common stock. We grant stock options at exercise prices not less than the fair value of our common stock at the date of grant. Prior to our IPO, our board of directors obtained contemporaneous valuations from an unrelated third-party valuation firm to determine the estimated fair value of common stock based on an analysis of relevant metrics, such as the price of the most recent convertible preferred stock sales to outside investors, the rights, preferences, and privileges of the convertible preferred stock, our operating and financial performance, the hiring of key personnel, the introduction of new products, the lack of marketability of the common stock, and additional factors relating to our business. There is inherent uncertainty in these estimates and if we or the valuation firm had made different assumptions, the amount of our stock-based compensation expense, net loss, and net loss per share amounts could have been significantly different. Following the completion of our IPO in February 2011, the fair value of options granted is based on the closing price of our common stock on the date of grant as quoted on the NASDAQ Global Market.

Historically, certain of our stock options were granted to officers with vesting acceleration features based upon the achievement of certain performance milestones. The timing of the attainment of these milestones affected the timing

of expense recognition since we recognize compensation expense only for the portion of stock options that are expected to vest.

We recorded stock-based compensation of $6.4 million, $4.1 million, and $2.8 million during 2013, 2012, and 2011, respectively. As of December 31, 2013, we had $15.7 million of unrecognized stock-based compensation costs, which are expected to be recognized over an average period of 2.6 years.

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Income Taxes

We use the asset and liability method to account for income taxes. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. Significant management judgment is required in determining our provision for income taxes, our deferred tax assets and liabilities, and any valuation allowance recorded against our deferred tax assets. Our provision for income taxes generally consists of tax expense/benefit related to current period earnings/losses. As part of the process of preparing our consolidated financial statements, we continuously monitor the circumstances impacting the expected realization of our deferred tax assets for each jurisdiction. We consider all available evidence, including historical operating results in each jurisdiction, expectations and risks associated with estimates of future taxable income, and ongoing prudent and feasible tax planning strategies in assessing the need for a valuation allowance. To the extent a deferred tax asset cannot be recognized, a valuation allowance is established to reduce our deferred tax assets to the amount that is more likely than not to be realized. We have recorded a full valuation allowance on our deferred tax assets due to uncertainties related to our ability to utilize our deferred tax assets in the foreseeable future. These deferred tax assets primarily consist of net operating loss carryforwards and research and development tax credits. We intend to maintain this valuation allowance until sufficient evidence exists to support its reduction. We make estimates and judgments about our future taxable income that are based on assumptions that are consistent with our plans and estimates. Should the actual amounts differ from our estimates, the amount of our valuation allowance could be materially impacted. Changes in these estimates may result in significant increases or decreases to our tax provision in a period in which such estimates are changed, which in turn would affect net income or loss.

We recognize the financial statement effects of a tax position when it is more likely than not, based on the technical merits, that the position will be sustained upon examination. Any interest and penalties related to uncertain tax positions will be reflected in income tax provision.

We have not provided for U.S. federal and state income taxes on any of our non-U.S. subsidiaries' undistributed earnings as of December 31, 2013 because such earnings are intended to be indefinitely reinvested. Upon distribution of those earnings in the form of dividends or otherwise, we may be subject to U.S. federal and state income taxes, the determination of which is not practical as it is dependent on the amount of U.S. tax losses or other tax attributes available at the time of the repatriation. Undistributed earnings of our foreign subsidiaries amounted to approximately $0.4 million at December 31, 2013.

Effective January 1, 2010, we obtained approval for Pioneer Tax Status in Singapore. We do not expect this status to have a material impact on our business, operating results, or financial condition. We cannot predict whether Pioneer Tax Status will have a material impact on our business, operating results, or financial condition in future periods because the availability of the tax incentives will depend entirely on the long-term development of our business.

Inventory Valuation

We record adjustments to inventory for potentially excess, obsolete, slow-moving, or impaired goods in order to state inventory at its net realizable value. The business environment in which we operate is subject to rapid changes in technology and customer demand. We regularly review inventory for excess and obsolete products and components, taking into account product life cycle and development plans, product expiration and quality issues, historical experience, and our current inventory levels. If actual market conditions are less favorable than anticipated, additional inventory adjustments could be required.

Results of Operations

Revenue

We generate revenue from sales of our products, license and collaboration agreements, and government grants. Our product revenue consists of sales of instruments and related services, and consumables, including IFCs, assays, and other reagents. We have entered into license and collaboration agreements and have received government grants to conduct research and development activities.

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The following table presents our revenue by source for each period presented (in thousands):

	Year Ended December 31,		
	2013	2012	2011
Revenue:			
Instruments	$41,053	$29,152	$25,190
Consumables	29,145	22,336	15,391
Product revenue	70,198	51,488	40,581
License and collaboration revenue	327	185	1,716
Grant revenue	658	661	568
Total revenue	$71,183	$52,334	$42,865

The following table presents our product revenue by geography and as a percentage of total product revenue by geography based on the billing address of our customers for each period presented (in thousands):

	Year Ended December 31,								
	2013			2012			2011		
United States	$36,308	52	%	$27,325	53	%	$21,644	53	%
Europe	18,472	26	%	13,086	26	%	10,499	26	%
Japan	6,639	10	%	3,840	7	%	3,942	10	%
Asia Pacific	6,564	9	%	6,321	12	%	3,698	9	%
Other	2,215	3	%	916	2	%	798	2	%
Total	$70,198	100	%	$51,488	100	%	$40,581	100	%

Our license and collaboration and grant revenue is primarily generated in the United States.

Our customers include academic research institutions, clinical laboratories, and pharmaceutical, biotechnology and Ag-Bio companies worldwide. Total revenue from our five largest customers in each of the periods presented comprised 18%, 17%, and 16% of revenue in 2013, 2012, and 2011, respectively.

Comparison of the Years Ended December 31, 2013 and December 31, 2012

Total Revenue

Total revenue increased by $18.8 million, or 36%, to $71.2 million for 2013, compared to $52.3 million for 2012 primarily due to product revenue.

Product Revenue

Product revenue increased by $18.7 million, or 36%, to $70.2 million for 2013, compared to $51.5 million for 2012. Instrument revenue increased by $11.9 million, or 41%, primarily driven by increases in unit sales of our preparatory systems, which include our C_1 Single-Cell Auto Prep System, first sold as a new product in the third quarter of 2012, and to a lesser extent, increases in unit sales of our BioMark HD System. Increased sales of our service offerings and higher average selling prices of our instrument systems also contributed to the increase in instrument revenue. The revenue increase was offset in part by lower unit sales of our EP1 System.

Consumables revenue increased by $6.8 million, or 30%, primarily due to growth in overall IFC unit volume, driven mainly by increased sales to production genomics customers. Annualized IFC pull-through for our analytical systems was within our historical range of $40,000 to $50,000 per system and above our historical range of $10,000 to $15,000 per system for preparatory systems. Going forward, we expect IFC pull-through for our preparatory systems to range from $15,000 to $25,000 per system per year. Increases in assays and reagents sales also contributed to the increase in consumables revenue.

We expect total unit sales of both instruments and consumables to increase over time as we continue our efforts to grow our customer base, expand our geographic market coverage, and launch new products. However, we expect the average selling prices of our products to fluctuate over time based on market conditions, product mix, and currency fluctuations.

Grant Revenue

Grant revenue consists of a grant from the California Institute for Regenerative Medicine (CIRM). Grant revenue was $0.7 million in each of 2013 and 2012. Our CIRM grant was awarded in 2011 in the amount of $1.9 million to be earned over a three-year period. The CIRM grant revenue is recognized as the related research and development

services are performed and

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costs associated with the grants are recognized as research and development expense during the period incurred. We expect total grant revenue for 2014 to be less than 2013 as our grant from CIRM expires in April 2014.

Cost of Product Revenue

The following table presents our cost of product revenue and product margin for each period presented (in thousands):

	Year Ended	
	December 31, 2013	December 31, 2012
Cost of product revenue	$20,204	$15,325
Product margin	71 %	70 %

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

Cost of product revenue increased by $4.9 million, or 32%, to $20.2 million for 2013 from $15.3 million for 2012 primarily due to increased product revenue. Cost of product revenue as a percentage of related revenue was 29% and 30% for 2013 and 2012, respectively. This improvement was driven by higher average unit selling prices for instruments and IFCs; a favorable change in the instruments sales mix primarily due to increased sales of our higher margin C_1 Single-Cell Auto Prep System, first sold as a new product in the third quarter of 2012; and higher IFC capacity utilization and improved production yields. This was offset in part primarily by higher inventory reserves and write-offs and higher service costs.

Operating Expenses

The following table presents our operating expenses for each period presented (in thousands):

	Year Ended	
	December 31, 2013	December 31, 2012
Research and development	$19,953	$ 16,602
Selling, general and administrative	48,412	38,478
Litigation settlement	1,267	—
Total operating expenses	$69,632	$ 55,080

Research and Development

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

Research and development expense was $20.0 million for 2013, an increase of $3.4 million, or 20%, compared to $16.6 million for 2012. The increase in research and development expense was primarily due to an increase in headcount and other compensation-related costs of $2.2 million, an increase in facility expenses of $0.7 million, and an increase in outside services of $0.3 million. These increased costs were in support of our development and commercialization of new and existing products and services.

We believe that our continued investment in research and development is essential to our long-term competitive position and these expenses will increase in future periods.

Selling, General and Administrative

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

and accounting services.

Selling, general and administrative expense increased $9.9 million, or 26%, to $48.4 million for 2013, compared to $38.5 million for