

AGILENT TECHNOLOGIES INC
Form 10-K
December 20, 2018
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 10-K

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended October 31, 2018

or

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

For the transition period from _____ to _____
Commission File Number: 001-15405

Agilent Technologies, Inc.

(Exact name of registrant as specified in its charter)

Delaware 77-0518772

State or other jurisdiction of I.R.S. Employer

Incorporation or organization Identification No.

Address of principal executive offices: 5301 Stevens Creek Blvd., Santa Clara, California 95051

Registrant's telephone number, including area code: (408) 345-8886

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

Title of each class	Name of each exchange on which registered
---------------------	---

Common Stock	New York Stock Exchange
par value \$0.01 per share	

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.
Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of 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.

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

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

Edgar Filing: AGILENT TECHNOLOGIES INC - Form 10-K

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

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

The aggregate market value of the registrant's common equity held by non-affiliates as of April 30, 2018, was approximately \$16.0 billion. Shares of stock held by officers, directors and 5 percent or more stockholders have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of December 10, 2018, there were 318,533,054 outstanding shares of common stock, par value \$0.01 per share.

DOCUMENTS INCORPORATED BY REFERENCE

Document Description	10-K Part
Portions of the Proxy Statement for the Annual Meeting of Stockholders (the "Proxy Statement") to be held on March 20, 2019, and to be filed pursuant to Regulation 14A within 120 days after registrant's fiscal year ended October 31, 2018 are incorporated by reference into Part III of this Report	III

Table of Contents

TABLE OF CONTENTS

	Page
<u>Forward-Looking Statements</u>	<u>3</u>
<u>PART I</u>	
<u>Item 1 Business</u>	<u>3</u>
<u>Item 1A Risk Factors</u>	<u>15</u>
<u>Item 1B Unresolved Staff Comments</u>	<u>24</u>
<u>Item 2 Properties</u>	<u>24</u>
<u>Item 3 Legal Proceedings</u>	<u>25</u>
<u>Item 4 Mine Safety Disclosures</u>	<u>25</u>
<u>PART II</u>	
<u>Item 5 Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities</u>	<u>25</u>
<u>Item 6 Selected Financial Data</u>	<u>28</u>
<u>Item 7 Management's Discussion and Analysis of Financial Condition and Results of Operations</u>	<u>29</u>
<u>Item 7A Quantitative and Qualitative Disclosures About Market Risk</u>	<u>49</u>
<u>Item 8 Financial Statements and Supplementary Data</u>	<u>50</u>
<u>Item 9 Changes in and Disagreements with Accountants on Accounting and Financial Disclosure</u>	<u>103</u>
<u>Item 9A Controls and Procedures</u>	<u>103</u>
<u>Item 9B Other Information</u>	<u>103</u>
<u>PART III</u>	
<u>Item 10 Directors, Executive Officers and Corporate Governance</u>	<u>103</u>
<u>Item 11 Executive Compensation</u>	<u>104</u>
<u>Item 12 Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters</u>	<u>104</u>
<u>Item 13 Certain Relationships and Related Transactions, and Director Independence</u>	<u>105</u>
<u>Item 14 Principal Accounting Fees and Services</u>	<u>105</u>
<u>PART IV</u>	
<u>Item 15 Exhibits, Financial Statement Schedules</u>	<u>105</u>

Table of Contents

Forward-Looking Statements

This report contains forward-looking statements including, without limitation, statements regarding trends, seasonality and growth in, and drivers of, the markets we sell into, our strategic direction, new product and service introductions and future products and services, adoption of our products, the ability of our products to meet market and customer needs, improving our customers' experience, future financial results, our operating margin, mix, our investments, including in manufacturing infrastructure and research and development, our ability to identify and enable synergies across our businesses, our focus on balanced capital allocation, competition, our contributions to our pension and other defined benefit plans, impairment of goodwill and other intangible assets, the effect of the U.S. Tax Cuts and Jobs Act of 2017 and U.S. and other tariffs, the impact of foreign currency movements, our hedging programs and other actions to offset the effects of tariffs and foreign currency movements, our future effective tax rate and tax valuation allowance, earnings from our foreign subsidiaries, repatriation of our earnings from foreign jurisdictions, the impact of local government regulations on our ability to pay vendors or conduct operations, our liquidity position, our ability to generate cash from operations, the potential impact of adopting new accounting pronouncements, indemnification, the use of contract manufacturers, our sourcing and third-party package delivery services, source and supply of materials used in our products, our sales, our purchase commitments, our capital expenditures, the integration of our acquisitions and other transactions, write down of investments values or loans and convertible notes, our stock repurchase program, our declared dividends, and the existence of economic instability, that involve risks and uncertainties. Our actual results could differ materially from the results contemplated by these forward-looking statements due to various factors, including those discussed in Part I Item 1A and elsewhere in this Form 10-K.

PART I

Item 1. Business

Overview

Agilent Technologies Inc. ("we", "Agilent" or the "company"), incorporated in Delaware in May 1999, is a global leader in life sciences, diagnostics and applied chemical markets, providing application focused solutions that include instruments, software, services and consumables for the entire laboratory workflow.

In 2018, we re-organized our operating segments and moved the microfluidics business from our life sciences and applied markets operating segment to our diagnostics and genomics operating segment. Following this re-organization and for the year ended October 31, 2018, we continue to have three business segments comprised of the life sciences and applied markets business, diagnostics and genomics business and the Agilent CrossLab business. All historical financial segment information for the life sciences and applied markets segment and the diagnostics and genomics segment has been recast to reflect this reorganization in our financial statements.

Our life sciences and applied markets business provides application-focused solutions that include instruments and software that enable customers to identify, quantify and analyze the physical and biological properties of substances and products, as well as enable customers in the clinical and life sciences research areas to interrogate samples at the molecular and cellular level. Our diagnostics and genomics business is comprised of six areas of activity providing solutions that include reagents, instruments, software and consumables which enable customers in the clinical and life sciences research areas to interrogate samples at the cellular and molecular level. The Agilent CrossLab business spans the entire lab with its extensive consumables and services portfolio, which is designed to improve customer outcomes. In addition, we conduct centralized order fulfillment and supply chain operations for our businesses through the order fulfillment and supply chain organization ("OFS"). OFS provides resources for manufacturing, engineering and strategic sourcing to our respective businesses. Each of our businesses, together with OFS and

Agilent Technologies Research Laboratories, is supported by our global infrastructure organization, which provides shared services in the areas of finance, information technology, legal, certain procurement services, workplace services and human resources.

We sell our products primarily through direct sales, but we also utilize distributors, resellers, manufacturer's representatives and electronic commerce. As of October 31, 2018, we employed approximately 14,800 people worldwide. Our primary research and development and manufacturing sites are in California, Colorado, Delaware, Massachusetts and Texas in the U.S. and in Australia, China, Denmark, Germany, Italy, Japan, Malaysia, Singapore and the United Kingdom.

Table of Contents

Life Sciences and Applied Markets Business

Our life sciences and applied markets business provides application-focused solutions that include instruments and software that enable customers to identify, quantify and analyze the physical and biological properties of substances and products, as well as enable customers in the clinical and life sciences research areas to interrogate samples at the molecular and cellular level. Key product categories include: liquid chromatography ("LC") systems and components; liquid chromatography mass spectrometry ("LCMS") systems; gas chromatography ("GC") systems and components; gas chromatography mass spectrometry ("GCMS") systems; inductively coupled plasma mass spectrometry ("ICP-MS") instruments; atomic absorption ("AA") instruments; microwave plasma-atomic emission spectrometry ("MP-AES") instruments; inductively coupled plasma optical emission spectrometry ("ICP-OES") instruments; raman spectroscopy; cell analysis plate based assays; flow cytometer; real-time cell analyzer; laboratory software for sample tracking, information management and analytics; laboratory automation and robotic systems; dissolution testing; vacuum pumps and measurement technologies.

We employed approximately 4,500 people as of October 31, 2018 in our life sciences and applied markets business.

Life Sciences and Applied Markets

Our life sciences and applied markets business focuses primarily on the following five markets:

The Pharmaceutical, Biotechnology, CRO & CMO Market. This market consists of "for-profit" companies who participate across the pharmaceutical value chain in the areas of therapeutic research, discovery & development, clinical trials, manufacturing and quality assurance and quality control. One sub-segment of this market is core and emerging pharmaceutical companies ("pharma"). A second sub-segment includes biotechnology companies ("biotech"), contract research organizations ("CROs") and contract manufacturing organizations ("CMOs"). Biotech companies and, to a somewhat lesser extent, CROs and CMOs typically participate in specific points in the pharmaceutical industry value chain. Additionally, due to the relatively low drug efficacy within oncology, pharma companies are partnering with diagnostic companies to bring validated tests to the market with their new drugs.

The Academic and Government Market. This market consists primarily of "not-for-profit" organizations and includes academic institutions, large government institutes and privately funded organizations. The academic and government market plays an influential role in technology adoption and therapeutic developments for pharmaceutical and molecular diagnostics companies. After decades of investment in basic biomedical research by government funding bodies, the focus has widened to include translational research - multidisciplinary scientific efforts directed at accelerating therapy development.

The Chemical & Energy Market. The natural gas and petroleum refining markets use our products to measure and control the quality of their finished products and to verify the environmental safety of their operations. Petroleum refiners use our measurement solutions to analyze crude oil composition, perform raw material analysis, verify and improve refining processes and ensure the overall quality of gasoline, fuels, lubricants and other products. Our solutions are also used in the development, manufacturing and quality control of fine chemicals and other industrial applications such as materials analysis.

The Environmental & Forensics Market. Our instruments, software and workflow solutions are used by the environmental market for applications such as laboratory and field analysis of chemical pollutants in air, water, soil and solid waste. Environmental industry customers include all levels of government, the industrial and manufacturing sectors, engineering and consulting companies, commercial testing laboratories and colleges and universities. Drug testing and forensics laboratories use our instruments, software and workflow solutions for applications such as analyzing evidence associated with crime, screening athletes for performance enhancing drugs, analyzing samples for recreational drugs, or detecting and identifying biological and chemical warfare agents. Some of our instruments are used in mobile laboratories as well. Customers include local, state, federal, and international law enforcement agencies and health laboratories.

The Food Market. Our instruments, software, and workflow solutions are used throughout the food production chain, including incoming inspection, new product development, quality control and assurance, and packaging. For example, our mass spectrometer portfolio is used to analyze contaminants and residual pesticides in food. There is also a significant food safety market involved in analyzing food for pathogen contamination, accurate verification of species type and evidence of genetically modified content.

Life Sciences and Applied Markets Products and Applications

Our products fall into eight main areas of work: liquid chromatography, gas chromatography, mass spectrometry, spectroscopy, software and informatics, lab automation and robotics, vacuum technology and cell analysis.

Table of Contents

Our key products and applications include the following technologies:

Liquid Chromatography

A liquid chromatograph ("LC") or a high performance liquid chromatograph ("HPLC") is used to separate molecules of a liquid mixture to determine the quantity and identity of the molecules present. The Agilent LC portfolio is modular in construction and can be configured as analytical and preparative systems. These systems can be stepwise upgraded to highly sophisticated, automated workflow solutions such as method development, multi method/walk-up, high-capacity/high-throughput or multi dimensional LC and can be extended to application based analyzers e.g. for bio-molecular separations, chiral analysis or size exclusion chromatography. As a leader in liquid chromatography, we continue to expand our application space with new HPLC columns, new services and diagnostics offerings and ongoing instrument and software product enhancements.

Gas Chromatography

Agilent is the world's leading provider of gas chromatographs, both laboratory and portable models. GC's are used to separate any gas, liquid or solid that can be vaporized and then detect the molecules present to determine their identity and quantity. Agilent provides custom or standard analyzers configured for specific chemical analysis applications, such as detailed speciation of a complex hydrocarbon stream, calculation of gas calorific values in the field, or analysis of a new bio-fuel formulation. We also offer related software, accessories and consumable products for these and other similar instruments.

Mass Spectrometry

A mass spectrometer ("MS") identifies and quantifies chemicals based on a chemical's molecular mass and characteristic patterns of fragment ion masses that result when a molecule is broken apart. Liquid chromatography is commonly used to separate compounds and introduce them to the MS system. The combined use of LC and MS is frequently used both to identify and quantify chemical compounds. Mass spectrometry is an important tool in analyzing small molecules and can also be used to characterize and quantify proteins and other biological entities. Agilent's LCMS portfolio includes instruments built around four main analyzer types - single quadrupole, triple quadrupole, time-of-flight ("TOF") and quadrupole time-of-flight ("QTOF"). We significantly expanded our mass spectrometry portfolio in recent years with a focus on improving performance, sensitivity, and ease of use.

Spectroscopy

Spectroscopy is a technique for analyzing the individual chemical components of substances based on the absorption or emission of electromagnetic radiation of specific wavelengths of light. Our spectroscopy instruments include AA spectrometers, microwave plasma-atomic emission spectrometers ("MP-AES"), ICP-OES, ICP-MS, fluorescence spectrophotometers, ultraviolet- visible ("UV-Vis") spectrophotometers, Fourier Transform infrared ("FT-IR") spectrophotometers, near-infrared ("NIR") spectrophotometers, Raman spectrometers and sample automation products. We also offer related software, accessories and consumable products for these and other similar instruments.

Software and Informatics

We provide software for instrument control, data acquisition, data analysis, laboratory content and business process management, and informatics. Our software facilitates the compliant use of instruments in pharmaceutical quality assurance/quality control environments. With our OpenLab Laboratory Software Suite, Agilent has a scalable, open software platform that enables customers to capture, analyze, and share scientific data throughout the lab and across the enterprise.

Lab Automation and Robotics

We offer a comprehensive suite of workflow solutions to our life science customers with the addition of automated liquid handling and robotics that range from standalone instrumentation to bench-top automation solutions. These solutions strengthen our offering of automated sample preparation solutions across a broad range of applications.

Vacuum Technology

Our vacuum technologies products are used to create, control, measure and test vacuum environments in life science, industrial and scientific applications where ultra-clean, high-vacuum environments are needed. Vacuum technologies' customers are typically OEMs that manufacture equipment for these applications, or government and research organizations that require vacuum solutions in their facilities. Products include a wide range of high and ultra-high vacuum pumps (diffusion, turbomolecular and ion getter), intermediate vacuum pumps (rotary vane, sorption and dry scroll), vacuum instrumentation (vacuum control

Table of Contents

instruments, sensor gauges and meters) and vacuum components (valves, flanges and other mechanical hardware). These products also include helium mass spectrometry and helium-sensing leak detection instruments used to identify and measure leaks in hermetic or vacuum environments. In addition to product sales, we also offer a wide range of services including an exchange and rebuild program, assistance with the design and integration of vacuum systems, applications support and training in basic and advanced vacuum technologies.

Cell Analysis

Our cell analysis tools are used to study cell signaling pathways, general cell function and behavior through metabolic profile analysis, real-time cellular impedance measurements, and traditional cytometry techniques. Characterizing cellular behavior and function is an increasingly critical step in understanding normal behavior versus diseased states, advancements of those diseases, and response to therapies, providing researchers with a more targeted approach for drug discovery and ultimately more effective therapeutics. Cell analysis customers are typically academic institutions and pharma and bio-pharma companies.

Life Sciences and Applied Markets Customers

We had approximately 24,000 customers for our life sciences and applied markets business in fiscal 2018. No single customer represented a material amount of the net revenue of the life sciences and applied markets business. A significant number of our life sciences and applied markets customers are also customers of our Agilent CrossLab business.

The life sciences and applied markets business is susceptible to seasonality in its orders and revenues primarily related to U.S. and foreign government budgets, chemical and energy and environmental customers and large pharmaceutical company budgets. Historically, the result is that our first and fourth fiscal quarters tend to deliver the strongest profits for this group. However, general economic trends, new product introductions and competition might overshadow this trend in any given year.

Life Sciences and Applied Markets Sales, Marketing and Support

The life sciences and applied markets channels focus on the therapeutics and human disease research customer base (pharma, biotech, CRO, CMO and generics), clinical customer base (high complexity clinical testing labs) and on emerging life sciences opportunities in life science research institutes. We deploy a multi-channel approach, marketing products to our customers through direct sales, electronic commerce, resellers, manufacturers' representatives and distributors. We primarily use direct sales to market our solutions to our pharmaceutical, biopharmaceutical and clinical accounts. Sales agents supplement direct sales by providing broader geographic coverage and coverage of smaller accounts. Our active reseller program augments our ability to provide more complete solutions to our customers. We sell our consumable products through distributors, electronic commerce and direct sales.

Our products typically come with standard warranties, and extended warranties are available for additional cost.

Life Sciences and Applied Markets Manufacturing

Our manufacturing supports our diverse product range and customer centric focus. We assemble highly configurable products to individual customer orders and make standard products to stock. We employ advanced manufacturing techniques and supply chain management systems to reduce costs and manufacturing cycle times. Our manufacturing process then converts these designs into standard as well as custom products for shipment to customers. We selectively use third parties to provide some supply chain processes for manufacturing, warehousing and logistics. We have manufacturing facilities in California, Delaware and Massachusetts in the U.S. Outside of the U.S., we have manufacturing facilities in Germany, Malaysia and Singapore. We have FDA registered sites in California, Germany and Singapore.

Life Sciences and Applied Markets Competition

The markets for analytical instruments in which we compete are characterized by evolving industry standards and intense competition. Our principal competitors in the life sciences and applied markets arena include: Danaher Corporation, PerkinElmer Inc., Shimadzu Corporation, Thermo Fisher Scientific Inc. and Waters Corporation. Agilent

competes on the basis of product performance, reliability, support quality, applications expertise, global channel coverage and price.

Diagnostics and Genomics Business

Our diagnostics and genomics business includes the genomics, nucleic acid contract manufacturing and research and development, pathology, companion diagnostics, reagent partnership and biomolecular analysis businesses.

Table of Contents

Our diagnostics and genomics business is comprised of six areas of activity providing active pharmaceutical ingredients ("APIs") for oligo-based therapeutics as well as solutions that include reagents, instruments, software and consumables, which enable customers in the clinical and life sciences research areas to interrogate samples at the cellular and molecular level. First, our genomics business includes arrays for DNA mutation detection, genotyping, gene copy number determination, identification of gene rearrangements, DNA methylation profiling, gene expression profiling, as well as next generation sequencing ("NGS") target enrichment and genetic data management and interpretation support software. This business also includes solutions that enable clinical labs to identify DNA variants associated with genetic disease and help direct cancer therapy. Second, our nucleic acid solutions business provides equipment and expertise focused on production of synthesized oligonucleotides under pharmaceutical good manufacturing practices ("GMP") conditions for use as API in an emerging class of drugs that utilize nucleic acid molecules for disease therapy. Third, our pathology solutions business is focused on product offerings for cancer diagnostics and anatomic pathology workflows. The broad portfolio of offerings includes immunohistochemistry ("IHC"), in situ hybridization ("ISH"), hematoxylin and eosin ("H&E") staining and special staining. Fourth, we also collaborate with a number of major pharmaceutical companies to develop new potential pharmacodiagnosics, also known as companion diagnostics, which may be used to identify patients most likely to benefit from a specific targeted therapy. Fifth, the reagent partnership business is a provider of reagents used for turbidimetry and flow cytometry. Finally, our biomolecular analysis business provides complete workflow solutions, including instruments, consumables and software, for quality control analysis of nucleic acid samples. Samples are analyzed using quantitative and qualitative techniques to ensure accuracy in further genomics analysis techniques utilized in clinical and life science research applications.

We employed approximately 2,500 people as of October 31, 2018 in our diagnostics and genomics business.

Diagnostics and Genomics Market

Within the diagnostics and genomics business, we focus primarily on the diagnostics and clinical market. A significant part of our clinical diagnostic customers are in pathology labs throughout the world. Our high-quality, automated pathology tissue staining platforms and solutions are used most heavily by the large labs located in hospitals, medical centers, and reference labs. The market is skewed towards mature economies, with most of the market in North America, Western Europe and Japan. The mix is changing, however, as emerging markets increase spending on human health.

The clinical market for genomics consists of high complexity clinical labs performing patient testing, including "for-profit" reference laboratories, hospital labs, and molecular diagnostic companies. While these labs primarily purchase in vitro diagnostics ("IVD") labeled testing kits, they often develop and validate their own molecular based tests. Analyte Specific Reagents ("ASRs") are often used by these labs.

Diagnostics and Genomics Products

Our products fall into eight main areas of work: pathology products, specific proteins and flow reagents, companion diagnostics, target enrichment, cytogenetic research solutions and microarrays, PCR and qPCR instrumentation and molecular biology reagents, nucleic acid solutions and automated electrophoresis and microfluidics.

Pathology

This area consists of routine clinical solutions for tissue based cancer diagnostics with solutions that comprise antibodies, reagents, instruments and software targeting both primary and advanced cancer diagnostics. Our CoverStainer and Artisan based product families target primary cancer diagnostics through hematoxylin and eosin staining as well as special stains for additional insights and detection of potentially carcinogenic tissue. In the fourth

quarter of 2013, we launched our combined IHC/ISH platform, Dako Omnis. The Dako Omnis and Autostainer based IHC solution and Instant Quality Fluorescence In Situ Hybridization ("IQFISH") technologies provide advanced tumor typing through investigation of protein and gene expression. These products also include companion diagnostic tests that are used to help identify patients most likely to benefit from a specific targeted therapy.

Specific Proteins and Flow Reagents

Our reagent OEM business is a provider of clinical diagnostic products within the areas of specific proteins for turbidimetry and reagents for flow cytometry. These are sold to OEM customers as customized reagent solutions supplied to top IVD companies or through retail partners.

7

Table of Contents

Companion Diagnostics

In our companion diagnostics business, we partner with a number of major pharmaceutical companies to develop new potential pharmacodiagnosics, which may be used to identify patients most likely to benefit from a specific targeted therapy.

Target Enrichment

Agilent continues to be a strong player in the next generation sequencing market. We provide a target enrichment portfolio composed of two main platforms, SureSelect and HaloPlex, both enabling customers to select specific target regions of the genome for sequencing. Customers can customize our products for their regions of interest using the SureDesign software, or they can choose from a wide range of catalog products, including gene panels for specific applications and Exome designs, which allow analysis of the entire coding sequences of the genome. After preparing samples with SureSelect and HaloPlex, products can be sequenced in the main next generation sequencing platforms available in the market. The technologies provide an easy sample prep workflow that can be automated with the Agilent Bravo platform for scalability. HaloPlex provides less-than-24-hours fast workflow, which makes it suitable for labs that require fast turnaround time from sample to results. These products are used for mutation detection and genotyping. Results can be easily analyzed using Agilent software solutions GeneSpring or SureCall. Our solutions also enable clinical labs to identify DNA variants associated with genetic diseases and help direct cancer therapy.

Cytogenetic Research Solutions and Microarrays

Agilent is a leading provider of microarrays for comparative genomic hybridization (“CGH”), mostly used by customers in cytogenetic laboratories. The arrays allow customers to detect genome-wide copy number alterations, with high levels of resolution (from entire chromosomal copy number changes to specific microdeletions or duplications). The arrays are offered in many formats allowing the customers to choose from different levels of resolution and number of samples per arrays. Arrays can also be customized using the SureDesign software. In addition to the microarrays, Agilent's solution includes reagents for sample processing, hardware for reading the microarrays, and software to help users view the data in a meaningful way. In addition to the CGH portfolio, the cytogenetics solution comprises a line of oligonucleotide probes for fluorescent in situ hybridization ("FISH") called SureFISH. Over 400 probes are available in our catalog, covering most relevant regions in the genome. Cytogenetic labs can use SureFISH probes to detect specific translocations or copy number changes in samples. Additionally, Agilent provides a wide range of microarrays to the research market for different types of applications: gene expression, microRNA, methylation, splice variants, and chromatin immunoprecipitation applications. Arrays are offered as catalog designs or customizable designs, with no minimum order size and short delivery time, which differentiates us from other vendors and enables researchers the maximum flexibility in their studies. Our end-to-end solution includes reagents for sample preparation and microarray processing; hardware for sample QC and high-throughput microarray scanning; microarrays on industry-standard 1” x 3” glass slides for key applications; custom microarray design services; and GeneSpring and CytoGenomics software products for data analysis.

PCR and qPCR Instrumentation and Molecular Biology Reagents

Polymerase chain reaction (“PCR”) is a standard laboratory method used to amplify the amount of genetic material of a given sample to enable further interrogation. Quantitative PCR (“qPCR”) or real time PCR is also a standard method used in genomic research facilities to measure the amount of a specific nucleic acid sequence within a sample. There are several applications for qPCR, among the most common are identifying the expression level of a specific gene, or calculating the amount of a specific pathogen present in a sample. Agilent offers a complete portfolio of PCR & qPCR instruments, as well as specialty enzymes for amplifying difficult sample types. In addition to PCR and qPCR

enzymes, Agilent offers a wide range of molecular biology reagents including tools for cloning and mutagenesis applications.

Nucleic Acid Solutions

Our Nucleic Acid Solutions division ("NASD") is a contract manufacturing and development services business with equipment and expertise focused on mid to large scale production of synthesized oligonucleotide APIs under pharmaceutical GMP conditions for an emerging class of drugs that utilize oligonucleotide molecules for disease therapy. These drugs have advanced from single strand DNA molecules to complex, highly modified molecules including antisense, aptamers, double-stranded RNA, and RNA mixtures. These advancements in the technology have greatly improved the efficacy of delivery and stability of the oligos in-vivo. NASD offers industry leading experience to efficiently advance our customer's oligo drug candidates from clinical trials to commercial launch with a common goal of patient health and safety.

Table of Contents

Automated Electrophoresis and Microfluidics

Automated electrophoresis is a separation technique for bio molecules such as proteins, peptides and nucleic acids (RNA and DNA) and is used to determine the identity of a molecule by either size or charge. It is widely used as a QC tool to check sample integrity prior to subsequent analysis. Prominent examples are nucleic acid preparation products in front of polymerase chain reaction, NGS and microarrays.

Diagnostics and Genomics Customers

We had approximately 11,000 customers for our diagnostics and genomics business in fiscal 2018. No single customer represented a material amount of the net revenue of the diagnostics and genomics business.

Diagnostics and Genomics Sales, Marketing and Support

The diagnostics and genomics channels focus on the therapeutics and human disease research customer base (pharma, biotech, CRO, CMO and generics), clinical customer base (pathology labs and high complexity clinical testing labs) and on emerging life sciences opportunities in life science research institutes. We deploy a multi-channel approach, marketing products to our customers through direct sales, electronic commerce, resellers, manufacturers' representatives and distributors. We primarily use direct sales to market our solutions to our pharmaceutical, biopharmaceutical and clinical accounts. Sales agents supplement direct sales by providing broader geographic coverage and coverage of smaller accounts. Our active reseller program augments our ability to provide more complete solutions to our customers. We sell our consumable products through distributors, telesales, electronic commerce and direct sales. We utilize telesales for more mature product lines, as well as for reorders of reagent products.

Diagnostics and Genomics Manufacturing

Our manufacturing supports our diverse product range and customer-centric focus. We assemble highly configurable products to individual customer orders and make standard products to stock. We employ advanced manufacturing techniques and supply chain management systems to reduce costs and manufacturing cycle times. We selectively use third parties to provide some supply chain processes for manufacturing, warehousing and logistics. We have manufacturing facilities in California, Colorado and Texas in the U.S. Outside of the U.S., we have manufacturing facilities in Denmark and Malaysia. Our FDA registered sites include California, Colorado, Texas and Denmark. We utilize just-in-time manufacturing and so typically do not maintain a high level of inventory.

Diagnostics and Genomics Competition

The markets for diagnostics and genomics analytical products in which we compete are characterized by evolving industry standards and intense competition. Our principal competitors in the diagnostics and genomics arena include: Roche Ventana Medical Systems, Inc., a member of the Roche Group, Leica Biosystems, Inc., a division of Danaher Corporation, Abbott Laboratories, Illumina, Inc. and Affymetrix, Inc., a division of Thermo Fisher Scientific Inc. Agilent competes on the basis of product performance, reliability, support quality, applications expertise, whole solution offering, global channel coverage and price.

Diagnostics and Genomics Government Regulation

Some of the products the diagnostics and genomics business sells are subject to regulatory approval by the FDA and other regulatory bodies throughout the world. These regulations govern a wide variety of product related activities, from quality management, design and development to labeling, manufacturing, promotion, sales and distribution. We continually invest in our manufacturing infrastructure to gain and maintain certifications necessary for the level of clearance.

Table of Contents

Agilent CrossLab Business

The Agilent CrossLab business spans the entire lab with its extensive consumables and services portfolio, which is designed to improve customer outcomes. The majority of the portfolio is vendor neutral, meaning Agilent can serve and supply customers regardless of their instrument purchase choices. Solutions range from chemistries and supplies to services and software helping to connect the entire lab. Key product categories in consumables include GC and LC columns, sample preparation products, custom chemistries, and a large selection of laboratory instrument supplies. Services include startup, operational, training and compliance support, software as a service, as well as asset management and consultative services that help increase customer productivity. Custom service and consumable bundles are tailored to meet the specific application needs of various industries and to keep instruments fully operational and compliant with the respective industry requirements.

Our Agilent CrossLab business employed approximately 5,100 people as of October 31, 2018.

Agilent CrossLab Markets

The Pharmaceutical, Biotechnology, CRO & CMO Market. Our services and consumable products support customers in this market that consists of “for-profit” companies who participate across the pharmaceutical value chain in the areas of therapeutic research, discovery and development, clinical trials, manufacturing and quality assurance and quality control. One sub-segment of this market is core and emerging pharmaceutical companies (“pharma”). A second sub-segment includes biotechnology companies (“biotech”), contract research organizations (“CROs”) and contract manufacturing organizations (“CMOs”). Biotech companies and, to a somewhat lesser extent, CROs and CMOs typically participate in specific points in the pharmaceutical industry value chain. Additionally, due to the relatively low drug efficacy within oncology, pharma companies are partnering with diagnostic companies to bring validated tests to the market with their new drugs.

The Academic and Government Market. Our services and consumable products support customers in this market that consists primarily of “not-for-profit” organizations and includes academic institutions, large government institutes and privately funded organizations. The academic and government market plays an influential role in technology adoption and therapeutic developments for pharmaceutical and molecular diagnostics companies. After decades of investment in basic biomedical research by government funding bodies, the focus has widened to include translational research - multidisciplinary scientific efforts directed at accelerating therapy development.

The Chemical & Energy Market. The natural gas and petroleum refining markets use our services and consumable products to support their quality control and environmental safety reviews.

The Environmental & Forensics Market. Our services and consumable products support the environmental industry customers that perform laboratory and field analysis of chemical pollutants in air, water, soil and solid waste. Environmental industry customers include all levels of government, the industrial and manufacturing sectors, engineering and consulting companies, commercial testing laboratories and colleges and universities. Our services and consumable products also support drug testing and forensics laboratories that are involved with analyzing evidence associated with crime, screening athletes for performance enhancing drugs, analyzing samples for recreational drugs, or detecting and identifying biological and chemical warfare agents. Customers include local, state, federal, and international law enforcement agencies and commercial testing laboratories.

The Food Market. Our services and consumable products support the food production chain, including incoming inspection, new product development, quality control and assurance, and packaging.

The Diagnostics and Clinical Market. Our services and consumable products support clinical diagnostic customers in pathology labs throughout the world. The market is skewed towards the mature economies, with most of the market in North America, Western Europe and Japan. The mix is changing, however, as emerging markets increase spending on

human health.

10

Table of Contents

Agilent CrossLab Products and Applications

Chemistries and Supplies

We offer a broad range of consumable products, which support our technology platforms, including sample preparation consumables such as solid phase extraction ("SPE") and filtration products, self-manufactured GC and LC columns, chemical standards, and instrument replacement parts. Consumable products also include scientific instrument parts and supplies such as filters and fittings for GC systems; xenon lamps and cuvettes for UV-Vis-NIR, fluorescence, FT-IR and Raman spectroscopy instruments; and graphite furnace tubes, hollow cathode lamps and specialized sample introduction glassware for our AA, ICP-OES and ICP-MS products.

Services and Support

We offer a wide range of startup, operational, educational and compliance support services for our measurement and data handling systems. Our support services include maintenance, troubleshooting, repair and training for all of our chemical and bioanalytical instrumentation hardware and software products. Special service bundles have also been designed to meet the specific application needs of various industries. As customers continue to outsource laboratory operations and consolidate suppliers, our enterprise services consist of a broad portfolio of integrated laboratory management services including instrument services, lab supply management, asset management, procurement, informatics and scientific services.

Remarketed Instruments

We refurbish and resell certified pre-owned instruments to value-oriented customers who demand Agilent quality and performance at a budget conscious price.

Agilent CrossLab Customers

We had approximately 51,000 Agilent CrossLab customers in fiscal 2018 and no single customer represented a material amount of the net revenue of the Agilent CrossLab business. A significant number of our Agilent CrossLab customers are also customers of our life sciences and applied markets business.

The service and consumables business is mostly recurring in nature, and is not as susceptible to market seasonality and industry cycles in comparison to our instrument businesses. The vendor neutral portion of the portfolio allows the business to perform relatively independent from our instrument business.

Agilent CrossLab Sales, Marketing and Support

We deploy a multi-channel approach, marketing products and services to our customers through direct sales, electronic commerce, resellers, manufacturers' representatives and distributors. We primarily use direct sales to market our solutions to our large accounts. Sales agents supplement direct sales by providing broader geographic coverage and coverage of smaller accounts. Our active reseller program augments our ability to provide more complete solutions to our customers. We utilize telesales to enhance the transactional sales model of our products. All channels are supported by technical product and application specialists to meet our customer's specific requirements. We deliver our support services to customers in a variety of ways, including on-site assistance with repair or exchange of returned products, telephone support and self-diagnostic services provided over the Internet. We also offer special industry-focused service bundles that are designed to meet the specific needs of hydrocarbon processing, environmental, pharmaceutical and biopharmaceutical customers to keep instruments fully operational and compliant with the respective industry requirements. Our products typically come with standard warranties, and extended

warranties are available for additional cost.
Agilent CrossLab Manufacturing

Our primary manufacturing sites for the consumables business are in California and Delaware in the U.S., and in the Netherlands and the United Kingdom outside of the U.S. Our direct service delivery organization is regionally based operating in 30 countries.

11

Table of Contents

Agilent CrossLab Competition

Our principal competitors in the services and consumable products arena include many of our competitors from the instrument business, such as: Danaher Corporation, PerkinElmer, Inc., Shimadzu Corporation, Thermo Fisher Scientific Inc. and Waters Corporation, as well as numerous niche consumables and service providers. Agilent competes on the basis of product performance, reliability, support quality, applications expertise, global channel coverage and price.

Agilent Technologies Research Laboratories