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Strategic Directions International, Inc.

# INSTRUMENT BUSINESS OUTLOOK



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Strategic Information for the Analytical & Life Science Instrument Industry

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## New Products Showcased at AMP

The Association for Molecular Pathology (AMP) 2016 annual meeting was held in Charlotte, North Carolina, from November 10 to November 12. The conference drew just over two thousand attendees, similar to last year, with over two hundred exhibitors. The theme of this year's conference was "Big World. Molecular Medicine. One Community."

The exhibits featured a number of product introductions for clinical molecular diagnostics. Illumina launched a 170-gene NGS solution called [TruSight Tumor 170](#). The product is touted to be the "only enrichment base to integrate DNA and RNA" on the market. The solution offers a workflow that can simultaneously target cancer-related aberrations, including SNPs, copy numbers and splice variants. Illumina has invested a great deal into the underlying enrichment and assay methodology, allowing for universal use and as an underlying platform for applications beyond solid tumor profiling. The standardized methodology can be customized, and is flexible to allow for universal utilization. The cost of the assay is \$625 per sample.

Oxford Nanopore Technologies showcased the [MinION](#), which became commercially available in May 2015. The

MinION has up to 512 channels for sequencing. The main improvements since its launch have been in regards to accuracy, which has improved from 90% to 97%, and the 9.4 version can process 10 GB in 48 hours. Subsequently, Oxford Nanopore Technologies launched the PromethION flow cell, which utilizes the same technology as the MinION, but has a much larger chip, allowing for up to 3,000 channels for sequencing. The target markets for both products are customers requiring real-time sequencing. However, given the capacity of the PromethION, the product is geared towards larger labs with a need for assay development.

At the show, Agilent Technologies released the [Cartagenia Bench Lab 5.0](#) version. The major new capability is the ability to perform somatic analysis. In addition, the software incorporates new knowledge sources (i.e., the CIViC database) along with variant information from curated and public databases. The database builds upon the current platforms for somatic variant classification and reporting tools. The software allows users to view data on a single screen with respect to SNPs, allowing for full-analysis capabilities for clinical geneticists and molecular pathologists.

Rubicon Genomics unveiled a new [Thruplex Enrichment Reagent Kit](#) at the meeting. The product's main purpose within the company's current portfolio is to connect the Rubicon Genomics Kit to Agilent Technologies capture probes (i.e., Agilent SureSelect). The kit is designed to simplify the current workflow and is due to start shipping in December 2016. The product is focused on targeted sequencing, with pricing yet to be finalized.

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## Pacific Biosciences Sues Oxford Nanopore

*Menlo Park, CA 11/2/16; Washington, DC 11/3/16; Oxford, UK 11/3/16*—Pacific Biosciences, provider of SMRT sequencing technology, has filed a complaint with the US International Trade Commission (ITC) against UK-based Oxford Nanopore, a maker of nanopore sequencing technology. The complaint asserts that Oxford Nanopore's MinION (see [New Products Showcased at AMP](#)) and PromethION systems and associated products infringe US Patent No. 9,404,146 (Compositions and Methods for Nucleic Acid Sequencing), which is owned by Pacific Biosciences. The complaint requests the ITC issue an order barring entry, sale and advertisement of the infringing products in the US. Issued in August, the Patent covers a method for sequencing single nucleic acid molecules using linked double-stranded nucleic acid templates. In response to the suit, Oxford Nanopore CEO Dr. Gordon Sanghera stated, "The new, out-of-the-blue ITC complaint shows some very one-dimensional reasoning." The company does not anticipate any disruption of its business, and believes the action is without merit.

*Pacific Biosciences stated on its quarterly conference call that it filed an ITC complaint instead of a lawsuit as the process is faster and less expensive. Earlier this year, Oxford Nanopore reached a settlement with Illumina for its ITC complaint involving patent infringement against the company (see **IBO** 10/15/16).*

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## Wako Chemicals Close to Sale

*Tokyo, Japan 11/3/16*—The *Nikkei Asian Review* has reported that Fujifilm is in talks to acquire Takeda Pharmaceutical's 70% share of Wako Pure Chemicals, a provider of laboratory chemicals. The acquisition price is expected to be ¥200 billion (\$1.93 billion = ¥103.63 = \$1). Wako Pure Chemicals recorded fiscal 2015 sales of ¥80 billion (\$772.0 million). Other reported bidders included Hitachi Chemical and the Carlyle Group. The acquisition is expected to be completed by March 2017.

*In addition to lab chemicals, Wako Pure Chemicals also supplies specialty chemicals and clinical diagnostic reagents. Wako Pure Chemicals is expected to join Fujifilm's Medical business, according to the article. Fujifilm Medical primarily provides diagnostic imaging systems. Fujifilm's lab research products include the QuickGene nucleic acid isolation system and kits, as well as the SPR-based AP-3000 system for drug discovery.*

## VWR Buys Manufacturing Firms

Radnor, PA 11/3/16—VWR, a provider of solutions to lab and production customers, has acquired two companies. The company has purchased Missouri-based Reliable Biopharmaceutical, a provider of high quality APIs and high purity ingredients for the biopharmaceutical industry. VWR has also purchased BioArra, a producer of serum-based products for cellular research and production applications. Based in Pennsylvania, BioArra offers semi-processed serum.

*The acquisitions further add to VWR's portfolio of self-manufactured products and specialty chemicals, which it has expanded over the years through acquisitions. As the company stated in its quarterly conference call, VWR provides the distribution channels to further grow Reliable and BioArra. VWR expects to spend \$145 million this year on acquisitions.*

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## Bruker Buys NAT Company

Billerica, MA 11/2/16—Bruker has acquired selected Scotland-based assets for the development, validation and commercialization of molecular assays for microbiology for use with its MALDI Biotyper system. Financial details were not disclosed. The acquisition includes lab infrastructure and IP. The real-time PCR-based assays will be developed for multiplex and syndromic panel testing. "In addition to conventional, targeted real-time PCR assays, Bruker sees further advantages in combining multiplexed syndromic PCR assays with a read-out on the MALDI Biotyper platform," said Dr. Wolfgang Pusch, executive vice president for Clinical MALDI Solutions. "Bruker intends to validate and launch the real-time PCR assays which have been acquired, and develop new multiplex PCR panels on the MALDI Biotyper platform in order to expand its assay menu to rapid targeted bacterial, fungal and viral identification, to fast antibiotic resistance testing, as well as to syndromic panels." Applications for multiplex PCR assays include early screening confirmation testing and broader syndromic testing.

*The acquisition expands Bruker's successful MALDI Biotyper instrument business into proprietary reagents. The transaction satisfies its specified goals to expand both its diagnostics consumables businesses, with the latest purchase appearing to have filled both criteria.*

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## LGC Adds to Standards Offerings

Teddington, UK 11/7/16—Lab product supplier LGC has acquired o2si smart solutions, a US-based provider of organic and inorganic reference materials. The acquisition increases LGC's standards portfolio for the food and environmental markets. "We are delighted to be adding o2si to our Standards division," commented Euan O'Sullivan, managing director of LGC's Standards Division. "It offers a highly complementary fit to our existing manufacturing capabilities across the United States and Europe, adding organic solution standards expertise as well as a quick turnaround, custom standards workflow to our offering."

*This is the latest acquisition of a standards provider for LGC, which has steadily built this business through acquisitions, and the first acquisition under its new owner, private equity firm KKR (see IBO 12/15/16), which has stated plans to grow LGC's life science business.*

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## Eppendorf Makes Acquisition

Hamburg, Germany 11/3/16—Life science company Eppendorf has announced the acquisition of Ireland-based Calibration Technology for an undisclosed amount. Eppendorf announced that the purchase allows it to expand its presence in Ireland. "We have had a very good partnership with Calibration Technology for many years now, and are

pleased that this acquisition will allow us to extend our service offering, especially for customers in regulated areas,” stated Eppendorf President and CEO Thomas Bachmann. Calibration Technology has been an authorized Eppendorf Service Center since 2008.

*Calibration Technology services pipettes, multichannel pipettes and analytical balances. As an Eppendorf Service Center, it offers services for Eppendorf’s pipettes and dispensers. Brian Kelly, general manager of Calibration Technology, will remain with the company.*

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## M&A Flurry Amidst Rising Valuations

Notwithstanding the blockbuster deals experienced in each of the past three years, merger and acquisition (M&A) activity in the analytical instrument and laboratory product-related industry remained robust in 2016. Despite certain limitations on the size of their M&A transactions due to deleveraging plans by Thermo Fisher Scientific and Danaher, both companies maintained their growth via acquisition strategies, and each topped the list of this year’s biggest spenders with combined transactions valued at roughly \$10 billion. Other companies, such as Bio-Techne and Sartorius, similarly followed through with M&A strategies to diversify product offerings. Also evident this year was greater M&A activity in laboratory-related markets from larger diversified companies.

While transactions were mostly driven by continued consolidation, M&A deals were further motivated by new market entries, diversification of product lines and faster growth opportunities, especially in the cell analysis and sequencing markets. However, given the primary focus on higher growth opportunities and competitive bidding, M&A deals reached higher-than-normal valuation and premium levels in 2016 compared to M&A deals covered by **IBO** in previous years.

**IBO**’s annual summary of M&A in the analytical instrument and lab product-related markets is comprised of deals announced in **IBO** between November 30, 2015, and November 15, 2016. The article and tables are based on publicly available information.

Following relatively restrained M&A capital deployment in 2015 (see **IBO** 11/15/15), Thermo Fisher resumed its aggressive buying tactics this year, spending a total of \$5.4 billion year to date, primarily for the acquisitions of Affymetrix (see **IBO** 1/15/16) and FEI (see **IBO** 5/31/16). While providing different market opportunities, both companies’ acquisitions offer financial benefits, including cost and revenue synergies, as well as EPS accretion.

Aside from the projected \$0.30 in adjusted EPS contribution in the first year, FEI adds electron microscopy to the company’s portfolio, and offers potential revenue synergies in various life sciences and materials science markets. Especially attractive for Thermo Fisher is the prospect to expand sales of FEI’s Cryo-EM systems in the fast growing structural biology market. Furthermore, FEI’s presence in the Czech Republic fits well with Thermo Fisher’s lower-cost manufacturing strategy. The acquisition, however, increases Thermo Fisher’s exposure to the cyclical semiconductor market and offers fewer cost synergies compared to its previous purchases, including Affymetrix.

Affymetrix, which expands Thermo Fisher’s recurring revenue base in the fast growing flow cytometry market, benefits from the expanded commercial and supply channel provided by Thermo Fisher, especially for the biopharmaceutical markets and China. The acquisition should also produce new growth opportunities for Thermo Fisher’s genetic analysis portfolio in clinical and agbio markets. However, in spite of the potential synergies, Thermo Fisher will need to address Affymetrix’s declining gene expression business, which has muted overall sales growth. Other Affymetrix suitors, including a group of former Affymetrix executives (see **IBO** 3/31/16) and Bio-Techne (according to Bio-Techne’s third quarter conference call), challenged the transaction but could not match the potential synergies. Thermo Fisher has already projected \$11 million in synergies by the end of this year and \$70 million by the third year, including \$55 million in cost savings and \$15 million in revenue.

**Three Best Values in 2016 for Pure-Play Companies  
Based on Revenue Multiples and Purchase Valuation Over \$5 Million**

Purchaser	Acquired	Purchase Price (\$M)	Acquired Co.'s Annual Sales (\$M)	Price to Sales Ratio
AMETEK	Brookfield Engineering	\$167	\$55	3.0
Danaher	Phenomenex	\$700	\$200	3.5
Thermo Fisher Scientific	Affymetrix	\$1,300	\$350	3.7

With the first major acquisitions following the spinoff of its industrial-focused business (see **IBO** 7/31/16), Danaher spent a little under \$5 billion combined for Cepheid (see **IBO** 9/15/16) and Phenomenex (see **IBO** 10/15/16), which bolsters its exposure to the molecular diagnostics and lab consumables markets, respectively. Given the competitive M&A environment, Danaher paid a significantly higher premium for Cepheid compared to its past acquisitions. Assuming strong double-digit sales growth and an enterprise valuation of \$4 billion for Cepheid, Danaher paid around 6.4 times projected 2016 revenue growth. Furthermore, Cepheid operated at a net loss, partly due to its strong R&D investment in clinical applications.

Despite only modestly adjusted EPS accretion of \$0.05 in the first year, the purchase of Cepheid offers longer-term financial opportunities, including strong top line growth, higher margin contributions and significant synergies. In a proxy statement, Cepheid's management projected double-digit annual revenue growth through 2025. Meanwhile, Danaher has identified \$200 million in synergies, including \$100 million in cost and revenue synergies each within a five-year period. While the company has a persuasive track record of accelerating operating efficiencies and leveraging its distribution channels, Danaher will need to balance future R&D investments against cost savings measures, as well as withstand any potential price erosion in the molecular diagnostics market.

Compared to Cepheid, Danaher's acquisition of Phenomenex is expected to produce a quicker return on investment. Danaher estimates a double-digit rate of return on invested capital in less than five years as a result of the more attractive valuation price. Motivated primarily by the strategic opportunities, Phenomenex will benefit from greater R&D resources, as well as product and geographic opportunities.

Increased M&A activity from larger diversified companies, such as AMETEK and Mettler-Toledo, is also notable this year. Mettler-Toledo made its first major laboratory-related purchase in several years, buying Henry Troemner for nearly \$100 million to expand its service, weighing and lab equipment businesses (see **IBO** 7/31/16).

After a quiet 2015 for analytical instrument purchases, AMETEK strengthened its laboratory instrumentation business in 2016, especially for QC applications, with the purchase of Brookfield Engineering (see **IBO** 2/15/16), which is now a unit of its Instrumentation and Specialty Controls division. The company provides AMETEK entry into the laboratory rheometer and viscometer market. Enhancing existing product lines, this year, AMETEK also purchased the ICP-MS firm Nu Instruments (see **IBO** 8/15/16) and HS Foils, which provides radiation detector components (see **IBO** 8/15/16).

Aside from Thermo Fisher and Danaher, both Bio-Techne and Sartorius pursued active M&A strategies motivated by product diversification. Bio-Techne expanded its portfolio, entering the genomics research and diagnostics markets with the purchase of Advanced Cell Diagnostics (ACD), which offers proprietary consumables for the detection of RNA at the cellular level (see **IBO** 7/15/16). Given the strong growth prospects and innovative technology, the acquisition price of \$250 million came at a steep premium of 10 times sales, and may also include up to an additional \$75 million based on certain milestones. Bio-Techne also added single-cell capabilities to its western product line via the acquisition of Zephyrus Biosciences (see **IBO** 3/31/16). According to an SEC filing, Bio-Techne paid \$8.0 million, net of cash acquired and up to \$3.5 million in contingency payments for the company, according to an SEC filing.

Also targeting cellular analysis, Sartorius purchased IntelliCyt, a maker of cell screening systems (see **IBO** 6/30/16) in 2016. While Sartorius has recently focused its acquisition activity on its bioprocess business, this purchase, as well as the acquisition of ViroCyt, which sells virus quantification technology (see **IBO** 7/15/16), expands the company's Lab Products & Services Division, adding life science instrumentation. The two companies are expected to add approximately \$20 million to Sartorius' combined annual sales on a pro forma basis.

**Three Highest Values in 2016 for Pure-Play Companies  
Based on Revenue Multiples and Purchase Valuation Over \$5 Million**

Purchaser	Acquired	Purchase Price (\$M)	Acquired Co.'s Annual Sales (\$M)	Price-to-Sales Ratio
Bio-Techne	Advanced Cell Diagnostics	\$250	\$25	10.0
PerkinElmer	Bioo Scientific	\$61	\$11	5.5
Sartorius	IntelliCyt	\$90	\$18	5.0

Like Bio-Techne and Sartorius, other companies also focused on the cell analysis market. Adding to its portfolio of cell biology products, Bio-Rad Laboratories made another technology purchase from Propel Labs (**IBO** 3/15/16), buying an analytical flow cytometer platform for fair value consideration of \$38.8 million, including \$29.3 million in contingency payments. When the product is commercialized, it will mark Bio-Rad's entry into that market. From the same firm, Bio-Rad previously purchased cell sorter technology (see **IBO** 10/31/12). Also adding to its existing cellular analysis business, which consist of consumables and kits, was Takara Bio. It announced the purchase of WaferGen Bio-systems (see **IBO** 5/15/16), which gives it microfluidic systems for the single-cell RNA sequencing market.

As in past years, the NGS market, from instrumentation to sample preparation to informatics, remains a highly dynamic and focused M&A area. Agilent Technologies joined the list of companies targeting complete clinical sequencing workflow solutions as it invested in early development firm LaserGen (see **IBO** 3/15/16). Despite a strong conviction in the sequencing technology, Agilent acquired only a 48% stake in the company but has the ability to purchase the remaining shares for roughly \$105 million before March 2018. Although the development requires additional R&D resources, the purchase structure limits Agilent's initial capital risk. However, with an expected commercial launch three to four years away, Agilent could face an already established and competitive market.

PerkinElmer added to its NGS offering with the purchase of Bioo Scientific, which offers NGS library preparation and multiplexing kits (see **IBO** 8/15/16), for \$61 million, net of cash acquired, according to an SEC filing. These kits are currently used with PerkinElmer's automated liquid handling benchtop systems, as well as with Illumina and Thermo Fisher NGS platforms. The acquisition also adds consumables products for food testing. The food testing area was additionally targeted by the company via its purchase of Delta Instruments (see **IBO** 2/29/16).

Private equity participation in analytical instrument and lab product M&A decelerated this year following a stronger presence a year ago. However, two notable purchases enhanced two firms' lab market presence. Major private equity firm KKR, which has invested in numerous health care companies, made its first transaction into the laboratory product market with the purchase of LGC, a provider of life sciences and laboratory testing products (see **IBO** 12/15/15). With additional financial backing, LGC later strengthened its high-throughput PCR offering via a majority share purchase in Douglas Scientific (see **IBO** 4/15/16).

Another private equity firm building a lab product franchise is One Equity Partners. Following the 2014 purchase of Duran (see **IBO** 12/15/14) and the 2015 acquisition of Wheaton (see **IBO** 9/15/15), this year One Equity announced the purchase of Kimble Chase Life Science & Research Products, a joint venture co-owned by Gerresheimer and Chase Scientific Glass (see **IBO** 9/15/16).

For the second consecutive year, Chinese firms invested in Western lab product companies to expand their product offerings and geographic reach. Jilin Zixin Pharmaceutical Industrial, a publicly held Chinese firm, invested in life science instrumentation, acquiring a 67% share of genome mapping firm Nabsys (see **IBO** 7/31/16). Another publicly held Chinese firm, analytical instrument provider Jinan Hanon Instruments, purchased the majority of European firm IMSPEX Diagnostics (see **IBO** 10/15/16).

A number of companies also chose to step away from certain businesses this year. In some cases, as with Analytik Jena's (Endress+Hauser's) sale of its Optics business unit to NOBLEX (see **IBO** 6/15/16), this meant an increased focus on analytical instrument and lab product offerings. In other cases, it meant a complete exit from the laboratory products market altogether, as with W. R. Grace's divested flash chromatography and LC detector product lines (see **IBO** 4/15/16) and the Gerresheimer transaction.

Other companies shed smaller, underperforming businesses, such as Oxford Instruments, which divested its Austin division (see **IBO** 1/15/16). Interestingly, such divestments included two testing services businesses: PerkinElmer's

NIPT screening lab services business (see **IBO** 4/30/16), and Beckman Coulter’s genomics services business (see **IBO** 12/31/15). As such, Beckman’s partners for this business included Affymetrix and Life Technologies, both of which are now a part of Thermo Fisher, a significant provider of genomics workflow solutions.

Five Largest Pure-Play Instrument and Laboratory Product–Related Acquisitions in 2016			
Purchaser	Acquired	Purchase Price (\$M)	Acquired Co.'s Annual Sales (\$M)
Thermo Fisher Scientific	FEI	\$4,200	\$930
Thermo Fisher Scientific	Affymetrix	\$1,300	\$350
Danaher	Phenomenex	\$700	\$200
Bio-Techne	Advanced Cell Diagnostics	\$250	\$25
AMETEK	Brookfield Engineering	\$167	\$55

## Third Quarter Financial Results

### Illumina Curbs Outlook

Illumina’s third quarter top line growth fell 3% below its expectations, as the company missed guidance for the third time in the last five quarters. Sales advanced 10.3% to \$607.0 million driven by demand for sequencing consumables and microarrays. In addition, shipments for oncology testing applications remained strong, climbing 24%. However, despite a projected drop due to the strong year-over-year comparison, sales of HiSeq systems missed company estimates. Furthermore, the company tapered its fourth quarter sales projections for high-throughput systems.

Following an internal review of its sales results, Illumina concluded that the variance in guidance for high-throughput systems in the second half of the year was negatively impacted by delayed US government funding, capital constraints as well as a change in delivery date for four of its customers. Furthermore, the company acknowledged a shift in demand and orders from HiSeq 2500 and 4000 to the HiSeq X and NextSeq platforms, which also may have impacted consumables purchases. While the company noted that there is little to suggest any market share losses or oversaturation of systems, Illumina may face some potential cannibalization of its HiSeq products by the lower-priced NextSeq.

Illumina’s sequencing sales improved 7%, led by consumables revenue growth of 24% to \$333 million, or roughly 56% of sequencing sales. Consumables were driven by strong utilization rates, especially for the HiSeq X and NextSeq. In view of slower demand for high-throughput instrumentation, sequencing systems revenue contracted 26%. However, sales of benchtop systems, especially NextSeq, MiSeq and MiniSeq, performed well and were in line with expectations.

Illumina Q3 FY16			
	Rev. (\$M)	% Rev. Growth	% of Rev.
Consumables	\$379.4	25.1%	63%
Instrument	\$125.6	-19.1%	21%
Other Products	\$4.9	18.3%	1%
Service & Other	\$90.2	17.7%	15%

Accounting for roughly 16% of revenues, microarray sales jumped 35%, led by demand from direct-to-consumer and 20% growth to agricultural customers. With orders for two million Infinium Global Screening Array (GSA) samples and growing interest in the Infinium XT, total array orders jumped 90%. Since the beginning of the year, the company has received orders for more than five million GSA samples, creating a healthy backlog for the next few years.

Total service and other revenue grew roughly 18%, led by genotyping services and sequencing instrument

maintenance contracts.

Illumina sales in the Americas grew 2%, a significant drop from the 13% growth in the second quarter. Including currency, Asia Pacific sales climbed 35%, led by China, where sales soared 85%. Following a decline in the second quarter, sales in Europe grew 16%, slightly ahead of expectations.

Adjusted gross margin slipped 63 basis points to 72.0% of sales because of increased investments in the clinical business, and expansion of sequencing consumables and array manufacturing operations. Given the increased financial commitments to its genetic startups Helix and Grail, adjusted operating margin fell 142 basis points to 28.7%. The company sharply lowered its fourth quarter sales growth expectation from roughly 16% to approximately flat or up 1%. Full-year sales are now expected to grow roughly 7%.

### PerkinElmer Falls Flat

PerkinElmer reported disappointing third quarterly results, as adjusted sales contracted roughly 1.6% organically to \$548.1 million. Excluding the extra week in the previous year, organic sales were flat. Sales missed company expectations by 4% primarily due to weak industrial and medical imaging markets, and lower analytical instrumentation sales. Strategic actions by the company to focus away from slower-growth areas as well as capital spending delays mostly resulted in the revenue shortfall. Total instrument sales declined in the mid-single digits. Conversely, consumables and services revenues each grew in the low single digits excluding the extra week.

On the positive side, the company stated that combined sales for targeted higher-growth businesses, such as reproductive health, food analysis, pharmaceutical services and diagnostics products, grew in upper single digits excluding the extra days and were up low double digits organically year to date.

Organic Human Health (HH) revenue was roughly flat, but grew in the low single digits excluding the extra week. Core diagnostic sales climbed in the high single digits organically, led by more than a 50% increase for the Haoyuan blood screening business and strong laboratory service revenue in India. However, Medical Imaging sales declined double digits. Life Science Solutions sales contracted in the low single digits as sales growth for the OneSource business was negatively impacted by the extra days. In addition, sales for the radiochemical business were weak. HH adjusted operating margin expanded 168 basis points to 24.6%.

PerkinElmer Q3 FY16					
	Rev. Growth	Curr.	Acq./ Div.	Org. Growth	% of Rev.
Human Health	-1.6%	0%	-2%	0%	62%
Environmental	-4.5%	-1%	1%	-5%	38%

Environmental Health (EH) sales contracted 5% organically due to weakness in environmental and industrial markets. With the exception of China, sales of environmental products declined, especially in the US and Europe. Food analysis organic sales were again strong in the quarter, and are up in the low teens for the year. EH adjusted operating margin climbed 277 basis points to 15.0%.

Overall, PerkinElmer sales in emerging markets grew in the high single digits organically, including 20% and 10% growth in China and India, respectively. Organic sales in developed regions declined in the mid-single digits.

Despite the revenue decline, adjusted gross profit margin improved 169 basis points to 49.0% as a result of productivity improvements and product mix. Adjusted operating margin advanced 126 basis points to 18.3% due to increased margins and cost saving measures.

The company cut its 2016 organic growth outlook from 4% to 2% due to the softer-than-expected demand from academic and government customers, as well as slower projected growth in developed regions. Fourth quarter organic sales are expected to grow just under 2% to \$610-\$620 million.

### Emerging Markets Boost Thermo Fisher Scientific Growth

Third quarter sales for Thermo Fisher Scientific grew 8.9%, 4.3% organically, to \$4.49 billion. Acquisitions contributed 4.9% to revenue growth, while currency headwinds reduced sales by 0.3%. Excluding the earlier-than-projected closing of the FEI acquisition (see *IBO* 5/31/16), which contributed just under \$100 million in sales, top

line growth met expectations. Pricing contributed roughly 0.6% to revenue growth. All sales figures below are organic.

End-market results were similar to the second quarter (see *IBO* 8/15/16), except for slightly stronger biopharmaceutical sales growth and weaker demand for industrial and applied markets. Biopharmaceutical sales grew roughly 11%, led by growth in the bioproduction and biopharma service businesses, as well as strong demand for chromatography and MS products. Diagnostics and healthcare sales grew approximately 3%, including particular strength in the clinical NGS and transplant diagnostics businesses. Academic and government sales improved roughly 1%, while industrial and applied market sales declined 1%. However, applied sales for environmental and food safety products were strong in China.

Among the four business segments, Life Science Solutions sales recorded the strongest organic growth, climbing 7.0%, led by bioproduction, bioscience and NGS sales. The company noted a strong uptake for the new Ion S5 and S5 XL NGS systems.

Thermo Fisher Scientific Q3 FY16				
	Rev. (M)	% Total Rev.	% Rev. Growth	% Org. Growth
Life Sciences Solutions	\$1,232	27.4%	14.0%	7.0%
Analytical Technologies	\$898	20.0%	15.4%	2.7%
Specialty Diagnostics	\$799	17.8%	2.8%	3.0%
Laboratory Products and Serv	\$1,746	38.9%	6.6%	5.7%

Analytical Technologies sales grew 2.7%, including higher sales of chromatography, MS and environmental products. However, growth was partially offset by weakness in the industrial-focused material sciences businesses. In regards to the Affymetrix acquisition (see *IBO* 3/31/16), sales for the bioscience business were strong, but partially offset by lower microarray sales. The company targeted \$11 million in cost synergies from the acquisition for the year, ahead of previous expectations of \$5-\$6 million.

Sales for the Laboratory Products and Services segment grew 5.3%, including particular strength in the biopharma services and channel businesses. Specialty Diagnostics revenue grew 3.0%, led by growth in the transplant diagnostics and immune-diagnostics businesses.

Geographically, Asia-Pacific sales grew roughly 15%, including 18% growth in China and nearly similar growth in India. Sales in other emerging markets were also strong. North American and European sales each grew roughly 2%. Sales to Rest of World declined approximately 2%.

Thermo Fisher's adjusted gross margin expanded 60 basis points to 48.9% due to productivity improvements, acquisitions and currency. Adjusted operating margin advanced 35 basis points to 23.0%.

The company raised the mid-point of its 2016 revenue guidance by \$400 million to \$18.25-\$18.39 million. This increase includes \$370 million from FEI and \$30 million from reduced currency headwinds projections. The organic growth outlook of 4.5% was unchanged. Acquisitions are projected to add 4.5% to revenue growth for the year, with currency headwinds lowering sales by 1%.

### **Waters Growth Remains Solid Despite Academic Drop**

Third quarter sales for Waters grew roughly 4.8% organically to \$526.8 million. Despite continued strength in the biopharmaceutical markets, Waters missed its quarterly sales expectations due to ongoing challenges in the industrial markets, as well as weak academic and government funding across most geographic regions.

Magnified by timing issues, academic and government sales declined 15% to make up 13% of revenues. Demand in this market was particularly vulnerable in Japan, Europe and the US, but grew in the low- to mid-single digits in Asia when excluding Japan.

Accounting for 30% of revenues, combined sales to industrial chemical, food, nutritional safety and environmental markets expanded a modest 1% organically due to weakness in the industrial chemical markets. However, sales for food testing applications climbed 7% organically.

Propelled by stronger-than-expected demand from smaller, specialty and biotechnology customers, biopharmaceutical sales climbed 13% organically to account for 57% of revenues. Growth continued to be particularly strong for large-molecule development.

Sales for the Waters segment grew 5% organically, led by healthy demand for chemistry consumables and services. On the consumables side, sales were strong for protein columns, GlycoWorks labeling kits and ACQUITY UPLC columns. Waters instrument sales expanded 3% organically, led by double-digit growth in China and strong demand for the newer ACQUITY Arc and Vion IMS Q-ToF systems. Sales were also robust for MS/MS, including the Xevo TQ-S micro and Xevo TQ-XS systems.

Waters Q3 FY16				
	Rev. (\$M)	Rev. Growth	Org. Growth	% of Rev.
<b>Waters Div.</b>	<b>\$471</b>	<b>5.7%</b>	<b>5%</b>	<b>47%</b>
Instrument Systems	\$226	3.2%	3%	43%
Chemistry Consum.	\$84	7.6%	6%	16%
Service	\$161	8.3%	8%	30%
<b>TA</b>	<b>\$56</b>	<b>1.7%</b>	<b>1%</b>	<b>11%</b>
Instrument Systems	\$40	-0.1%	-1%	8%
Service	\$16	6.2%	5%	3%

TA sales grew at a slower-than-expected rate, rising 1% organically. Geographically, TA sales grew in the strong double digits in China, but were mostly offset by mid-single digit declines in the US and Europe.

Overall, sales in Asia climbed 13% excluding currency, led by strong double-digit growth in China and India. US and European sales each declined 1% excluding currency. Weakness in Eastern Europe and the Middle East offset strength in Western Europe. In the US, sales were strong in pharmaceutical markets, especially for specialty and biotechnology companies, but were offset by lower government and academic spending. Japan was mixed, as strength from biopharmaceutical customers was mostly offset by weakness in academic and government, as well as industrial markets.

Total adjusted gross margin slipped 13 basis points to 58.6% of sales primarily due to stronger service revenue. Conversely, this product mix along with currency benefits from the declining British pound and controlled spending boosted operating margin 146 basis points to 29.5%. The company projected 2016 currency-neutral sales to grow 6%, which was at the low end of the company's previous guidance of 6%-7%.

CY Q3 2016 Results								
	Revenues			Rev. Growth Summary			Adj. Operating Profit	
	Rev. (\$M)	% of Co. Rev.	% Growth	% Curr.	% Acq./Div.	% Org. Growth	(\$M)	% Growth
Illumina	\$600.1	100%	11.3%	0%	0%	11%	\$0.1	-3.0%
PerkinElmer	\$548.2	100%	-2.7%	0%	-1%	-2%	\$100.1	4.5%
Thermo Fisher Scientific	\$4,490.9	100%	8.9%	0%	5%	4%	\$1,032.5	10.6%
Waters	\$526.8	100%	5.2%	0%	0%	5%	\$156.0	15.7%

## High-Throughput Nucleic Acid Sample Prep Systems

High-throughput nucleic acid sample preparation systems are fully automated instruments that enable efficient and fast extraction and isolation for purification of biological samples in order to provide a high yield of nucleic acid material for further downstream analysis. Whether you are interested in isolating one group of target molecules (DNA, RNA, plasmids) or all three, the first part of the process is extracting and purifying nucleic acids from different sample types such as cells, FFPE tissue samples or genomic suspensions. This sample preparation step is critical for multiple reasons, including prevention of nucleic acid degradation, minimization of contaminants and the provision of higher sample yield.

In contrast to traditional time consuming purification methods, fully automated sample prep systems offer an array of advantages, such as an increased throughput and speed of nucleic acid preparation, effectiveness for smaller sample sizes, and improved efficiency for complex sample types.

A sample containing the desired material is placed into a specialty column containing a separation media, which is usually a membrane or silica-based resin. Reagents are then placed into the column to release the DNA or protein from the sample matrix, i.e., amplification primers or electrophoresis gels. The columns fit into micro-centrifuge tubes, which capture the isolated nucleic acid. The sample mixture is then forced through the separation media by centrifugation. There are completely automated sample prep systems that use liquid handling robots to perform purification procedures and employ a vacuum manifold.

Recently, resin and membrane systems have been integrated with magnetic bead platforms. Magnetic beads attain a higher purity and product yield. The process, which is somewhat gentler than standard methods, involves moving the liquid sample through beads much like LC. Each of the super-paramagnetic beads employed contains affinity groups on its surface, which are turned on with a magnetic field. Once the beads and liquid sample are mixed via agitation, a magnet is then used to immobilize the magnetic particles and trap the molecule of interest, where upon unbound analytes are removed by aspiration. The bound analytes are then detached from the bead, washed and collected for subsequent analysis. Biomagnetic bead separation offers several advantages because it subjects the analytes to very little mechanical stress and avoids the use of hazardous or toxic material.

The applications for high-throughput systems are diverse, including PCR clean-up, DNA purification, target enrichment, and the isolation of RNA or genomic DNA. The total market for high-throughput nucleic acid sample prep instruments was close to \$400 million in 2015 and continues to grow at an average annual rate of approximately 3%. While the growth of low-throughput automated systems has slowed recently due to market saturation, the market for high-throughput units and automated purification systems are growing, as they increase their presence in the pharmaceutical and biotechnology industries, predominantly driven by their efficiency for NGS applications and PCR workflows.

German sample solutions manufacturer QIAGEN is the largest supplier of high-throughput nucleic acid sample prep technology, with over half of the automated sample prep instrument market share in 2015. Its fully automated, high-throughput offerings include the QIAcube HT and the QIASymphony SP/AS. Other prominent vendors in this automated systems market are PerkinElmer, Promega and Thermo Fisher Scientific. Illumina, a major player in the sample prep aftermarket, entered the systems market with its NeoPrep instrument in February 2015.

### **High-throughput Nucleic Acid Sample Prep Systems at a glance:**

*Leading Vendors (in order by market share):*

- QIAGEN
- Thermo Fisher Scientific
- Promega

*Largest Markets:*

- Hospital and Clinical
- Academia
- Biotechnology and Pharmaceuticals

*Instrument Cost:*

- \$25,000–\$65,000

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## **Energy**

Last December, at the Paris climate conference, virtually all the countries in the world agreed to concentrate efforts to fend off a rise of over 2 degrees Celsius above pre-industrial levels in average global temperatures. Industry thought leaders posit that in order to reach this goal, over 66% of global coal, oil and natural gas reserves may

remain untouched, unless there are new technological innovations in eliminating or lessening the harmful effects of carbon emissions. They suggest that it is imperative for energy companies to consider climate change policies when developing business strategies.

The International Energy Agency forecast that global oil demand could decrease more than 20% to 74 million barrels per day by 2040 if the global warming levels are kept at the agreed upon figure at the Paris conference, while oil companies project that global oil demand will keep growing. In order to reach the Paris global warming levels, governments will need to enable major shifts in technology and policy, such as developing advanced biofuels to produce renewable fuels without affecting food supplies; creating improved and more cost-effective batteries for electric cars and establishing recharging stations more extensively; and raising prices for carbon-based fuels in countries like the US to decrease demand, and promote carbon capture and sequestration. All of these shifts require changes in the political and technological landscapes. Oil companies are changing strategies for these shifts as well, such as financing research into carbon capture and sequestration, investing in biofuels and solar power, and working to reduce methane emissions.

**Source:** [The New York Times](#)

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## Pharmaceuticals

According to a report released by QuintilesIMS Institute last month, health care systems are having difficulties in keeping up with the rapid pace of innovation and information in the biopharmaceuticals industry. The report suggests that more intelligent analytics be applied to cross-industry datasets to help advance drug development and commercialization. The report calls for a transformation of clinical research (i.e., more efficient execution of clinical trials, improved patient-targeting, etc.) that in turn can improve outcomes for patients, such as their standards for care and treatment, and increase the market value for medicines. The nine evidence-based approaches presented by the report that could enhance the collection and interpretation of datasets to accelerate drug development consist of: identifying exact potential indications and target endpoints in clinical studies; refining the criteria for patient targeting; improving the locations where clinical trials are held; using risk-based monitoring to execute clinical trials; collecting a wide source of medical data to better drive patient care and treatment solutions; boosting patient adherence levels in medication usage; providing appropriate medications to patients and physicians; demonstrating medical value for patients; and using post-market information to bridge gaps in cross-industry data and to predict market trends. The report accentuates that data should not be a limited resource and should cross organizational boundaries, and that evidence-based portfolios would better indicate the value of new medicines to health care investors in the biopharmaceuticals industry. Future challenges of cross-industry datasets include data privacy, data transparency and collaboration of data technology.

**Source:** [QuintilesIMS Institute](#)

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## Clinical

In September, a Quest Diagnostics report revealed that many people are failing workplace drug use tests. The report studied the results of over 10.5 million workplace drug tests, and the greatest increase in drug use among employees was indicated by hair sample results. However, these results are contestable, because although the FDA approves the usage of hair samples for testing, the federal government does not consider hair samples as a reliable testing method for regulated programs. Proponents of hair testing posit that new hair cells absorb molecules of substances that circulate in blood, which create a permanent record in the hair as it grows. After dissolving the hair sample into solvents, GC/MS is used to classify drug particles and metabolites. Currently, the Department of Human Health and Services is in the process of evaluating the efficacy of hair testing and if it should be added to the federal employee screening process.

Generally, drug molecules are detectable in hair samples for up to 90 days, giving a more rounded indication of the employee's lifestyle. However, due to various studies over the years that have proved that drug molecules are more easily absorbed by dark hair than light hair, there is a possible racial bias in using hair samples for drug use testing. Melanin plays a key role in the absorption rate of drug metabolites in hair, and dark-haired people who use various hairstyling products have hair that is more susceptible to being permeated by drug molecules. Hair testing cannot yet distinguish between drug metabolites from ingestion or from environmental exposure. For these purposes, some scientists are suggesting the use of hair testing for clinical and research purposes only.

**Source:** [STAT News](#)

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## China

At this year's BioCentury China Healthcare Summit in Shanghai last month, nine trends were highlighted within the country's health care sector: economic reform; CFDA reform; accelerated pricing and access reform; restructuring of the generic drugs industry; a shift towards tiered diagnostics and treatment; a push for localization; the acceleration of private health care; the emergence of more innovative business models; and future outbound health care deals. Chinese companies have lower profit margins in the pharmaceuticals, semiconductors, communications equipment and automobile industries compared to global contemporaries.

In 2013, three out of China's eight engineering-based industries were above the country's share of global GDP, while nine out of the country's twelve efficiency-based industries were above China's share of global GDP. However, there is a major discrepancy in China's science-based industries, of which zero out of the four industries (branded pharmaceuticals, specialty chemicals, semiconductor design and biotechnology) performed above the country's global share of GDP.

M&A in China are also increasing, with the volume of M&A peaking in the fourth quarter of 2015. Though M&A has decreased in 2016, it is still at a record high for the country, especially in regards to outbound M&A, which grew almost eight times the amount of inbound M&A. This was largely due to ChemChina's acquisition of Sygenta for \$43 billion. In 2016, the total value of outbound M&A in the health care industry was \$8.5 billion. Chinese health care innovation has been increasing throughout 2016, with 2015's CFDA reform raising aspirations that regulatory processes will be accelerated, allowing for more scientific advancements and an improved quality of prescription drugs. The majority of industry experts are hopeful that the "well-designed" CFDA reform will actually be implemented.

**Source:** *McKinsey Global Institute*

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## Mexico

Between 2012 and 2014, Mexican R&D expenditures have steadily increased, reaching 0.54% of GDP in 2014. A key factor in Mexico's increase in R&D has been the PECiTI (Special Program of Science and Technology Innovation), the public policy for the goals, strategies and methods to accelerate science, technology and innovation in the country. Approved by the federal government in 2002, PECiTI aims to increase expenditure in research and innovation (R&I), encourage regionalization, bolster human and infrastructure capacity, and commercialize research findings. The Program's objective is to strengthen R&D investments to 1% of GDP by 2018, creating an environment for research, competition and innovation to help sustain the country's economic growth. Long term, PECiTI aims for R&D expenditure to reach 2.3% of GDP over the next 25 years.

The majority of growth in R&I is propelled by federal funding. In 2008, fiscal incentives to R&I for private companies were removed by the government, causing a decrease in R&I investments by the private sector. Mexico began considering reinstating such fiscal incentives in May 2016.

In contrast to R&D of other countries in the Organization for Economic Cooperation and Development, Mexican basic research is increasing, while technology development is decreasing. Commercializing research results, and

developing and establishing technology startups continue to pose challenges. Within the last 10 years, there has been a decentralization of policies, which has encouraged growth in R&I within state governments, although the federal government remains the largest investor in R&D. Foreign R&D investments decreased from 2012 to 2014; however, the country remains in the top 10 for foreign direct investment, mostly in regards to its manufacturing industry.

Source: [European Commission](#)

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## India

Pharmaceutical R&D investments for the top 25 companies has increased by 24.1% from September 2015 to September 2016, due to international competition and patent expiration issues, which has encouraged Indian pharmaceutical companies to accelerate innovation. On average, companies invested 7.8% of total net revenue on R&D in 2015-16, an 18.2% increase from 2013-14. However, India's pharmaceutical companies are approximately 10% below the global average R&D spend, as the top 15 global pharmaceutical companies typically spend over 17% of total net revenue on R&D. From January to September 2016, Indian pharmaceutical companies received FDA approvals for 33% of total submissions and FDA approvals for 48% of tentative applications. In comparison to the same time period last year, there was a 24.8% increase in final approvals, largely attributed to the growth of R&D investments. India's Sun Pharmaceutical leads the country's pharmaceutical R&D expenditure, with INR 2,303 crore (\$346.2 million) spent in 2015-16, up 17.8%. Dr. Reddy's Laboratories' R&D spend increased 6.2% to INR 1,790 crore (\$269.1 million). Lupin, Alembic Pharma and Ajanta Pharma had amongst the highest R&D expenditure increases, with Lupin's R&D investments rising 54.8% to INR 1,732 crore (\$260.3 million), while both Alembic Pharma and Ajanta Pharma's R&D spending increased over 100% to INR 255 crore (\$38.3 million) and INR 149 crore (\$22.4 million), respectively.

Source: [Pharmabiz](#)

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## Sequencing

### Company Announcements

In September, **Dovetail Genomics** signed a comarketing agreement with **Illumina** for promotion of its sequencing assembly services for long-range sequencing applications leveraging Illumina technology.

**Pacific Biosciences** announced in September that **Dovetail Genomics** added Pacific Biosciences' technology to its menu of genome assembly services. The companies also signed a comarketing agreement.

**10X Genomics** entered into a distribution agreement in September with **SCRUM** for Japan.

In September, **10X Genomics** named John Pouk as CCO. He was previously with **Agilent Technologies**, where his roles included senior vice president, Global Sales and International Operations.

In September, **Rubicon Genomics** and **Curio Genomics** agreed to comarket their respective ThruPLEX Tag-seq Kits and bioinformatics software package.

**Quantapore**, a developer of a single-molecular sequencing technology using nanopores, announced in September the closing of a Series C financing round, led by **China BioPharma Capital I**.

In September, **Active Motif** entered into a technology development partnership with **Swift Biosciences** to deliver advancements in ChIP-Seq workflow. The combined technologies allow researchers to use as little as 10 pg of ChIP enriched material.

**ReadCoor**, a company launched by **Harvard University's Wyss Institute for Biologically Inspired Engineering**

to commercialize FISSEQ (Fluorescent In Situ Sequencing Technology), completed an oversubscribed \$23 million Series A financing round in September. FISSEQ is a high-throughput spatial gene sequencing technology that simultaneously reads the sequences of thousands of RNAs and visualizes their 3-D coordinates within whole cells and tissues.

In September, **Agilent Technologies** and **Burning Rock** signed an agreement to develop cancer diagnostics in China based on the Agilent SureSelect target enrichment system. Burning Rock plans to register the kit with the China FDA.

**QIAGEN** announced in September a collaboration with the **International Commission on Missing Persons** for development and validation of complete NGS solutions as well as forensic panels for identifying missing persons using SNPs.

### Product Introductions

In September, **Appistry** launched an end-to-end solution (from sequencing through prioritization of variants) for NGS workflows using its GenomePilot platform.

**GenomeNext** launched in September the Olympus platform for automated 'omics-based analysis and interpretation, featuring a DNA (germline and somatic) analysis solution and RNA analytics, as well as the ability to integrate other 'omics-based tools. The company also introduced the Discovery Analytics platform for performing complex discovery and genetic association studies in a matter of minutes, combining clinical assessments and sample-specific conditions.

**Oxford Gene Technology** introduced in September the SureSeq myPanel NGS Custom Cancer Panels for NGS, featuring gene content from key cancer types and hybridization-based capture.

In September, **DNASTAR** launched Lasergene 14, which includes three new applications: the GenVision Pro genome browser; the NovaDock protein-protein docking application; and NovaFold Antibody, a specific antibody structure prediction programs.

### Sales/Orders of Note

In September, **Bluebee** announced the adoption of its cloud-based genomic analysis solutions by **GATC Biotech** to support large-scale services.

**DNAnexus** announced in September that healthcare informatics solutions provider **M2Gen** selected its cloud translational science platform for its Oncology Research Information Exchange Network Avatar Research Program.

In September, **GenomOncology** announced that **Genomics England** will integrate its GO Knowledge Management System for clinical reporting enablement.

In September, **DNA Electronics** announced the receipt of a contract from the US's **Biomedical Advanced Research and Development Authority** worth up to \$51.9 million to develop a sequencing platform for rapid diagnosis of antimicrobial-resistant infections and influenza.

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## Broad-based Companies

### Company Announcements

In September, **Analytik Jena** set up a joint application center, in cooperation with lab furniture supplier

**Wesemann**, for teaching and research at the **Fresenius University of Applied Sciences** in Hessen, Germany. Analytik Jena provided six instruments.

**Halma** named Jennifer Ward, its Group Talent Director, as a director in September.

In October, **Sartorius** announced that CFO Jörg Pfirmann will leave the company in July 2017.

**Hitachi High-Technologies Europe** announced in October that it will acquire Swedish-based **Spectral Solutions**, its Nordic region distributor for electron microscopes. Spectral Solutions will become Hitachi High-Technologies Europe's Swedish office. Spectral Solutions has seven employees. Hitachi High-Technologies Europe has 117 employees.

In October, **PerkinElmer** named Samuel R. Chapin to the Board. He most recently served as executive vice chairman of Global Corporate & Investment Banking for **Bank of America Merrill Lynch**.

**Agilent Technologies** named Roeland G.W. Verhaak, PhD, as the winner of its Early Career Professor Award in October. He was selected for his contributions to the implementation of transcriptomics, genomics and big-data analysis to the classification and diagnosis of various cancer types. He recently joined the **Jackson Laboratory** as professor and associate director of computational biology.

In October, **Agilent Technologies** presented an Agilent Thought Leader Award to Dr. Scott Lowe in recognition of his contributions to the identification of key genes and their characterization as therapeutic targets using novel genetic screens and animal models. He is chair of the Cancer Biology & Genetics Program at the **Sloan Kettering Institute** as well as chair of the **Geoffrey Beene Cancer Research Center at the Memorial Sloan Kettering Cancer Center**. The Award will support his work on the development and implementation of next generation CRISPR-based genetic screens to systematically identify and characterize novel targets for cancer therapeutics.

**bioMérieux's** third quarter revenue for Industrial Applications grew 7.0%, 8.7% at constant exchange rates, to €93.6 million (\$102.9 million = €0.91 = \$1). Sales of the VIDAS, VITEK and culture media lines resulted in increased sales to the food industry.

**Merck KGaA** named Isabel De Paoli as chief strategy officer, effective October 1. She heads the newly created Group Strategy and Transformation function. She assumes the new role in addition to her current role as head of Group Communications.

**GE** announced on its third quarter conference call that GE Healthcare Life Science revenue grew 11% organically and orders rose 4% organically. Bioprocess orders increased 5%. Excluding a major prior year order, Bioprocess orders were up 22%.

In October, **Eppendorf** announced the creation of a new Board position that includes Sales, Marketing and Service in order to focus on developing the company's market presence. As a result, Dr. Ralf Hermann, chief Marketing & Portfolio officer, will lead the Board this month.

**Xylem** third quarter revenue for the Test business of its Water Infrastructure segment declined 8% due to a large project in Latin America in the prior year and lower government, and oil and gas sales in the US.

In November, **Illumina** announced that Christian O. Henry, executive vice president and CCO, will leave the company in January 2017. Mark Van Oene, vice president and general manager of the Americas Commercial Operation, will serve as interim CCO.

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## Informatics

### Company Announcements

**Schrödinger** announced in October an agreement with China-based **Tsinghua University's School of Pharmaceutical Sciences** to establish a center of excellence in structure-based drug discovery. Schrödinger will provide computational chemistry software and work with faculty to create a curriculum. The parties may also enter

into research collaborations.

**SolveBio** announced that its translational medicine software is now available on the Science Exchange marketplace, a marketplace for outsourced research.

**Benchling** announced in October that it raised \$7 million in new funding, led by Thrive Capital. The company has now raised over \$13 million.

In October, **Lab7** closed \$3.0 million financing of a planned \$5.0 million Series A round.

**Optibrium** and **Collaborative Drug Discovery** announced a collaboration to integrate their respective StarDrop and CDD Vault platforms. CDD Vault is a hosted biological and chemical database.

### Product Introductions

**Optibrium** announced in October the launch of a database query interface for its StarDrop software.

### Sales/Orders of Note

In October, **labfolder** announced a licensing agreement with the **Max Planck Society** to provide up to 11,000 scientists across all scientific disciplines with its lab data digital management platform.

**ACD/Labs** announced in October that **Willmar Schwabe Pharmaceuticals** selected its ADD/Spectrum Platform for analytical data handling and knowledge management.

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## Reported Financial Results

\$US	Period	Ended	Sales	Chg.	Op. Prof.	Chg.	Net Prof.	Chg.
Agilent Technologies	Q4	31-Oct	\$1,111.0	7.3%	\$183.0	17.3%	\$124.0	-11.4%
Agilent Tech. (Life Sciences & Applied)	Q4	31-Oct	\$548.0	6.4%	\$125.0	21.4%	NA	NA
Agilent Tech. (Diagnostics & Genomics)	Q4	31-Oct	\$193.0	8.4%	\$38.0	11.8%	NA	NA
Agilent Tech. (Agilent CrossLab)	Q4	31-Oct	\$370.0	8.2%	\$84.0	-2.3%	NA	NA
Agilent Technologies	FYE	31-Oct	\$4,202.0	4.1%	\$615.0	17.8%	\$460.0	14.7%
Agilent Tech. (Life Sciences & Applied)	FYE	31-Oct	\$2,073.0	1.3%	\$429.0	12.9%	NA	NA
Agilent Tech. (Diagnostics & Genomics)	FYE	31-Oct	\$709.0	7.1%	\$114.0	29.5%	NA	NA
Agilent Tech. (Agilent CrossLab)	FYE	31-Oct	\$1,420.0	6.8%	\$316.0	5.7%	NA	NA
Bio-Rad Laboratories	Q3	30-Sep	\$508.7	8.3%	\$28.1	-14.0%	\$18.4	6.0%
Bio-Rad Laboratories (Life Science)	Q3	30-Sep	\$178.1	18.4%	(\$4.4)	64.2%	NA	NA
Brooks Auto. (Life Science Systems)	Q4	30-Sep	\$31.7	85.8%	\$1.1	NM	NA	NA
Brooks Auto. (Life Science Systems)	FYE	30-Sep	\$108.1	58.8%	(\$6.5)	67.1%	NA	NA
Bruker	Q3	30-Sep	\$393.9	-0.6%	\$45.9	62.8%	\$46.5	294.1%
Bruker (Scientific Instruments)	Q3	30-Sep	\$361.5	-1.4%	\$43.3	67.8%	NA	NA
Datacolor	FYE	30-Sep	\$69.3	3.8%	\$6.2	43.4%	\$6.0	90.9%
Fluidigm	Q3	30-Sep	\$22.2	-22.5%	(\$18.5)	-136.9%	(\$19.8)	-113.5%
Illumina	Q3	2-Oct	\$607.1	10.3%	\$160.7	14.1%	\$128.7	8.9%
Pacific Biosciences	Q3	30-Sep	\$25.1	80.5%	(\$16.7)	NM	(\$17.5)	NM
PerkinElmer	Q3	2-Oct	\$548.1	-2.7%	\$81.2	7.0%	\$58.1	5.9%
PerkinElmer (Human Health)	Q3	2-Oct	\$338.2	-1.6%	\$64.6	2.2%	NA	NA
PerkinElmer (Environmental Health)	Q3	2-Oct	\$209.8	-4.5%	\$27.7	21.1%	NA	NA
QIAGEN	Q3	30-Sep	\$338.7	7.7%	\$47.0	1.7%	\$33.8	-0.5%
VWR	Q3	30-Sep	\$1,136.1	3.7%	\$83.2	2.6%	\$40.6	269.1%
VWR (Americas)	Q3	30-Sep	\$707.7	6.0%	\$47.2	0.0%	NA	NA
VWR (EMEA-APAC)	Q3	30-Sep	\$428.4	0.2%	\$36.0	6.2%	NA	NA
Other Currencies								
HORIBA	Q3	30-Sep	¥36,917	-6.0%	¥2,880	0.4%	¥3,153	47.8%
HORIBA (Process & Environmental)	Q3	30-Sep	¥4,010	8.8%	¥254	18.1%	NA	NA
HORIBA (Scientific)	Q3	30-Sep	¥5,767	-5.6%	-¥177	NM	NA	NA
Merck KGaA (Life Science)	Q3	30-Sep	€ 1,391.0	83.2%	€ 216.0	123.2%	NA	NA
Oxford Instruments	H1	30-Sep	£171.5	4.1%	£9.4	-3.1%	-£0.7	NM
Oxford Instr. (NanoTechnology Tools)	H1	30-Sep	£90.9	6.4%	£11.2	17.9%	NA	NA
Oxford Instr. (Industrial Products)	H1	30-Sep	£42.9	-5.7%	£1.4	-17.6%	NA	NA
Oxford Instr. (Service)	H1	30-Sep	£37.7	11.2%	£6.4	-27.3%	NA	NA
Shimadzu	Q2	30-Sep	¥85,033	-4.5%	¥10,738	-0.8%	¥7,241	-3.0%
Shimadzu (Analytical & Measuring Instr.)	Q2	30-Sep	¥51,255	-5.8%	¥9,241	-3.1%	NA	NA

NA = not available NM = not meaningful