

# Source Book

August 2020



# ILLUMINA'S MISSION

To improve human health by unlocking the power of the genome.

## 2020 Key Focus Areas



**ENABLE**  
Breakthrough Genomics  
Research



**ACCELERATE**  
Clinical Adoption  
of Genomics



**ADVANCE**  
Technology Leadership  
and Innovation

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# ABOUT ILLUMINA

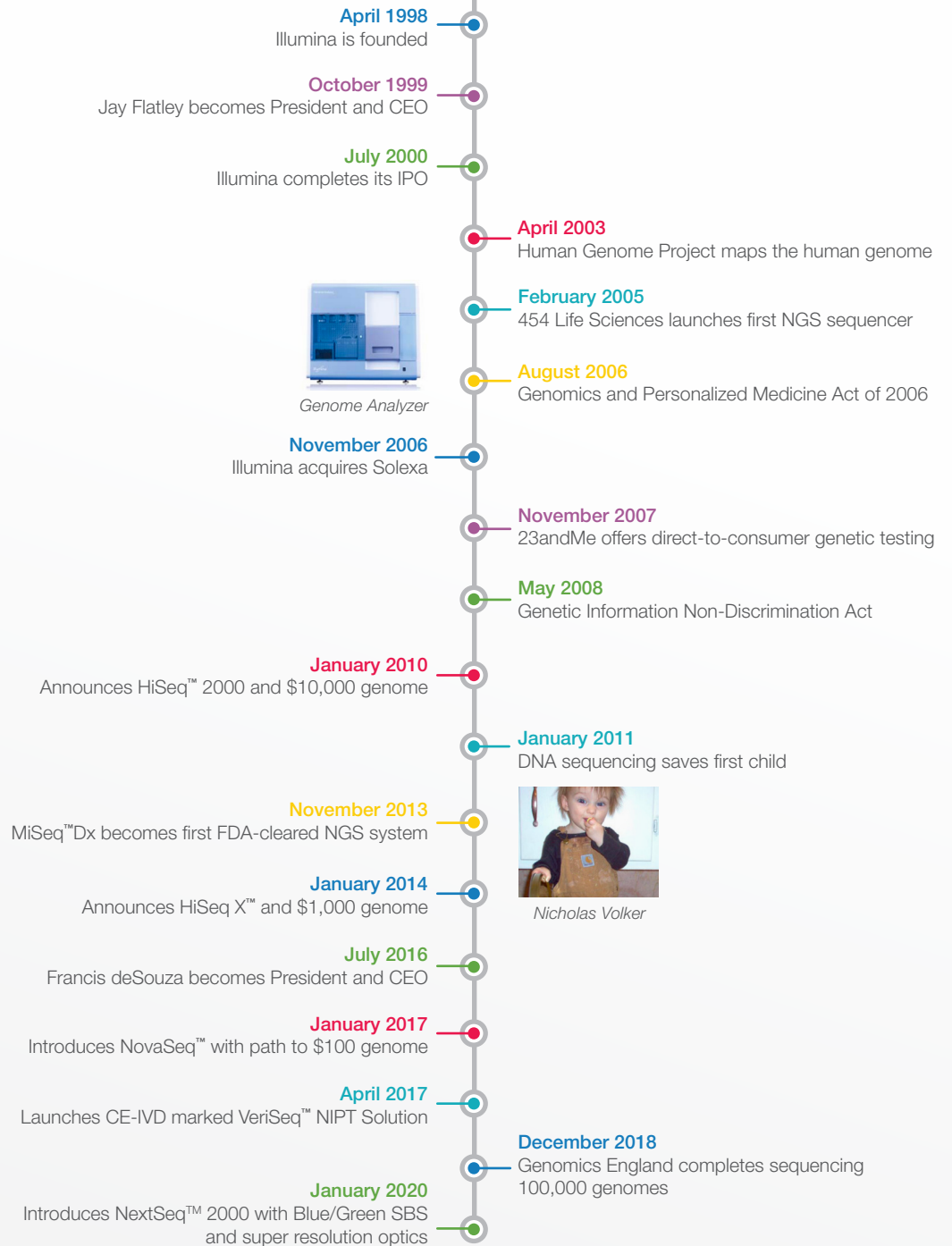
As a startup, Illumina aspired to transform human health. Our initial products enabled researchers to explore DNA at an entirely new scale, helping them create the first map of gene variations associated with health, disease, and drug response. Every breakthrough opened up a new world, and showed us how much further there is to go.

While the rate of progress is rapidly accelerating, we are only beginning to understand the clinical significance of the genome. What causes a cancer cell to mutate? What is the origin of a puzzling disease? Is it possible to prevent the next outbreak? Or safeguard the world's food supply? These are just a few of the challenges that inspire us to push the boundaries of our imagination.

Today we are a global leader in genomics – an industry at the intersection of biology and technology. At the most fundamental level, we enable our customers to read and understand genetic variations. We strive to make our solutions increasingly simple, more accessible, and always reliable. As a result, discoveries that were unimaginable even a few years ago are now becoming routine – and are making their way into patient treatment.

## Illumina Milestones

## Genomic Milestones





# OUR CULTURE

## Overview

Illumina is committed to building, innovating, and winning as an inclusive team. With more than 7,700 global employees and 20 offices across 8 countries, our cultural values continue to be key to the company's success.



**Innovation is in our DNA**



**We are relentless in the creation of great products**



**We collaborate deeply**



**We move fast and embrace change**



**We are open**



## Strategy

Illumina will cultivate an agile, innovative workplace built to deliver exceptional performance. We will be recognized as a leading employer for top talent driven by our humanistic mission, culture of care, commitment to diversity & inclusion and development of extraordinary leaders.

## Culture of Care

To ensure employees know how much they are valued, Illumina has implemented several policies to demonstrate our Culture of Care.

### Compassion and care time off

*100% of pay for 30 days*

### Medical and sick leave support

*100% base pay for 12 weeks*

### Flexible time off

*Paid time off without accrual limits*

### Health and Lifestyle allowance

*\$500 for health, lifestyle and well-being*

### Universal variable compensation program

*100% of employees eligible for bonus pay*

### Progressive, personalized benefits

*Programs for fertility, expert second opinions, and genomic resources*

## Notable Awards

- Glassdoor Employees' Choice Best Place to Work (2019)
- Computerworld Best Place to Work in IT (2019, 2018, 2017)
- Corporate Equality Index's Best Places to Work for LGBTQ (2020)
- Forbes' The World's Most Innovative Companies (2018, 2017, 2016, 2015, 2014)
- Forbes' Most Just Companies (2019)
- Member of Bloomberg Gender-Equality Index (2020, 2019)



# CORPORATE SOCIAL RESPONSIBILITY: OVERVIEW

## Background

Illumina's Corporate Social Responsibility (CSR) strategy focuses on the areas where we can uniquely impact the global community and the issues that matter most to our business and stakeholders. We are dedicated to making a positive impact on humanity, not just through our technology, but also through our actions. Illumina has identified three CSR Focus Areas, which are supported by two foundational elements. Our priorities and targets are aligned with the United Nation's Sustainable Development Goals. For more information, please refer to Illumina's first **CSR report**.

## Accelerating Access to Genomics

We are committed to connecting individuals, families, and communities to genomic solutions.



**2020 Goal**  
400 iHope Cases

Access for Patients and Families



Partnership with:  
 BlueCross BlueShield Association

Access for Communities

Access through Partnerships and Education



## Empower our Communities

We aim to share our time, talent, and technology with the communities where we live and work.



### 2030 Targets

**100%**

Increase in the # of participants touched by our STEM Programs<sup>1</sup>

**90%**

Of employees surveyed feel Illumina supports employees giving back to the community

**50%**

Of employees participate in our giving or volunteering programs<sup>2</sup>

## Environmental Sustainability

We invest in sustainable solutions across our facilities, products and business practices.

### Select 2030 Targets include:



**30%**

Decrease CO<sub>2</sub> emission<sup>3</sup>



**50%**

Increase in renewable energy use



**75%**

Reduction in packaging



**90%**

Reduction in use of dry ice



**100%**

Strategic suppliers commit to reducing environmental footprint

<sup>1</sup> Participant target based on 2019 baseline of 306,170 participants touched by STEM. Participants defined as employees + students + educators  
<sup>2</sup> 2019 participation rate was 40%  
<sup>3</sup> Based on the concepts outlined by the Paris Climate Accord and Science Based Target methodology for 2 degree reduction using absolute percent reductions. Scope 1 and 2 emission reduction baseline and target include main campuses, commercial locations, and Illumina operated distribution centers. Commercial locations utilized industry estimates if actual energy usage data was not available due to shared lease agreements, etc.

# CORPORATE SOCIAL RESPONSIBILITY: FOUNDATIONAL ELEMENTS

## Our People

At Illumina, we strive to foster an innovative workplace, powered by passionate people, to deliver on the transformative power of genomics. Our culture is fueled by openness, collaboration, caring, and innovation.



### Promoting Diversity and Inclusion through:

- Cultural competence
- Equal Opportunity
- Employee Resource Groups



### Committing to Zero Net Gap in Pay:

- 2019 confirmed zero net gap in pay
- Women represented 43% of total workforce and 45% of new hires



### Building, Investing, and Developing Talent:

- Develop a robust, diverse pipeline of future talent through the iAspire Internships
- Professional development resources for employees, including LinkedIn Learning
- Coaching and leadership development for emerging leaders and high potentials



### Providing a Safe Workplace Environment:

- Global Environment, Health and Safety (EHS) engagement programs
- Prevention-based ergonomic resources
- Prevention and preparedness teams, including a Global Injury & Illness Prevention Program

## Ethics and Governance

Ethics and governance are foundational elements of our CSR program and how Illumina does business. It ensures that our business principles align with our core values, ethical responsibilities, and legal obligations.

Code of Conduct Languages

8

Employees certified to the Code

100%

### Code of Conduct

Illumina is committed to conducting its business in compliance with all applicable laws and regulations, and with the highest ethical standards. Illumina provides training on the Code of Conduct for new and existing employees, along with training on other company policies.

### Human Rights

Illumina acknowledges and respects the fundamental principles contained in the Universal Declaration of Human Rights and the United Nations Global Compact, and is committed to integrating these principles into our strategy, our culture, and our operations.

### Protecting Privacy

Illumina is committed to handling personal information according to applicable laws and the following guiding principles: transparency, responsible stewardship, ethical use, and accountability.

### Integrity Across our Supply Chain

All new suppliers are required to acknowledge the Supplier Code of Conduct prior to onboarding.



# ETHICS ADVISORY BOARD

Illumina is committed to building our company with integrity and ethical business behavior.

## What is Illumina's Ethics Advisory Board?

Since 2008, Illumina convened an Ethics Advisory Board (EAB) to ensure that Illumina acts ethically and justly in its business operations. The EAB meets quarterly to advise and provide recommendations regarding ethical issues involving Illumina's existing, emerging, and prospective products, services, and processes both from a research and clinical perspective. This includes providing strategic advice to Illumina regarding emerging ethical issues, policies, and regulations relevant to the genomics industry.



**Clement Adebamowo, BM, ChB, ScD, FWACS, FACS**

Clement Adebamowo is Professor of Epidemiology, Associate Director of Population Science and Director for Global Health Cancer Research at the Greenebaum Comprehensive Cancer Center, and member of the Institute of Human Virology at the University of Maryland School of Medicine. He was foundation chair of the Nigerian National Health Research Ethics Committee, Principal Investigator of several NIH-funded genomics, cancer and bioethics research and training projects including the Indigene Study, a project for improvement of comprehension of informed consent for genomic ethics in African communities that incorporates an online database of words related to genomics in local African languages.



**Leslie Biesecker, M.D.**

Les is a clinical and molecular geneticist and is the chief of the Medical Genomics and Metabolic Genetics Branch at the National Human Genome Research Institute (NHGRI) of the National Institutes of Health. Dr. Biesecker directs the ClinSeq project with goals to improve medical care for patients and provide generalized knowledge about genetic disease. He is a member of the National Academy of Medicine.



**Glenn Cohen, J.D.**

Glenn is a Deputy Dean and Professor of Law at Harvard Law School and the Faculty Director for the Petrie-Flom Center for Health Law Policy, Biotechnology, and Bioethics. An award-winning academic and lawyer, Glenn's work has appeared in leading publications and his amicus briefs have been discussed by the United States Supreme Court. His current research focuses on big data, health information technologies, research ethics, reproductive technology, and health policy.



**Freda Lewis-Hall, MD, DFAPA, MFPM**

During her 35-year career in medicine, Dr. Freda Lewis-Hall has been on the frontlines of health care as a clinician, educator, researcher, and leader in the biopharmaceuticals and life sciences industries. Freda most recently served as Pfizer, Inc.'s Chief Medical Officer and Executive Vice President until the end of 2018 and as Chief Patient Officer and Executive Vice President during 2019. In these roles, Freda expanded outreach to patients, reshaped the focus on patient engagement and inclusion, improved health information and education, and amplified the voice of the patient within company culture and decision-making.



**Nita Farahany, J.D., Ph.D.**

Nita is the Robinson O. Everett Professor of Law & Philosophy at Duke University, and the Director of Duke Science & Society Initiative. President Obama appointed Nita to the Presidential Commission for the Study of Bioethical Issues in 2010 and she served until 2017. She is a leading scholar on the ethical, legal, and social implications of biosciences and emerging technologies, particularly those related to neuroscience and behavioral genetics.



**Charmaine Royal, Ph.D.**

Charmaine is an Associate Professor of African & African American Studies, Biology, Global Health, and Family Medicine & Community at Duke University. She directs the Center on Genomics, Race, Identity, and Difference and the Center for Truth, Racial Healing, and Transformation at the Social Science Research Institute. Charmaine's main academic interest is in addressing root causes and implementing sustainable solutions regarding problems of race and racism in research, healthcare, and society.

# INSTALLED BASE AND CUSTOMER EXAMPLES



A leading academic research center using genomics to advance the understanding and treatment of human disease.



Develops and sells a portfolio of genomic tests, including the FDA-approved FoundationOne CDx that detects genetic mutations and TMB.



A premier center of genomic discovery, leading collaborations across the globe.



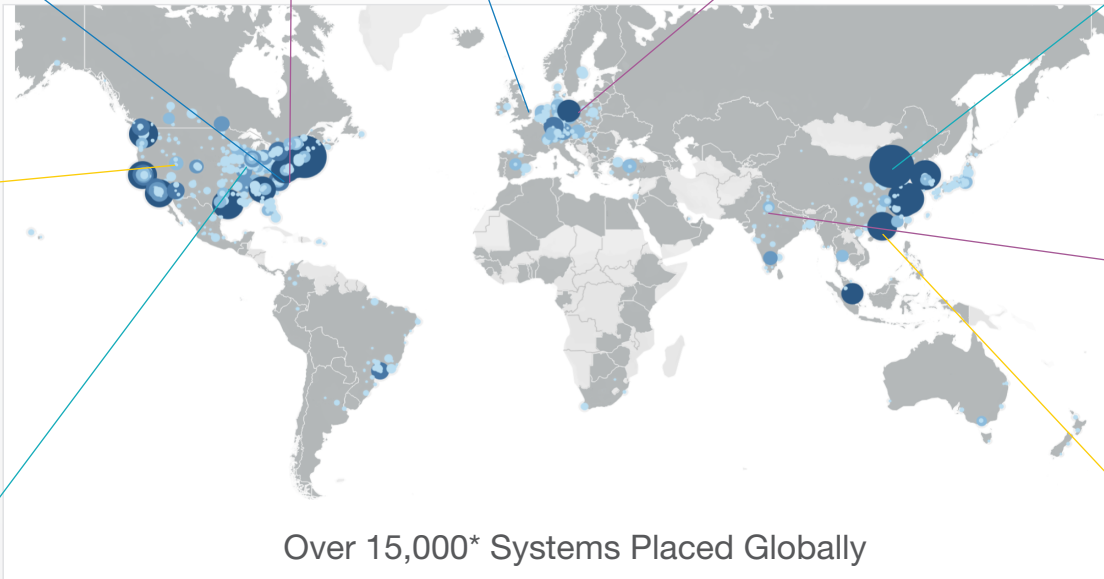
A global leader in genetic diagnostics for rare hereditary diseases with testing samples from over 125 different countries.



A Chinese prenatal genetic testing and diagnostics company that has a partnership with Illumina for CFDA approved NIPT kit.



Discovers genealogy and geographic origins. Samples are processed by Illumina and Quest Diagnostics.



Because diagnosis matters

FIND India focuses on evaluation and demonstration studies of new diagnostic tools that FIND co-develops, supporting the Revised National Tuberculosis Control Program by building programmatic capacity for genome sequencing in India.

## TEMPUS

A technology company that enables physicians to deliver personalized cancer care for patients through its platform. Also provides genomic sequencing services and data analysis to empower physicians.



A personal genomics company that has a platform providing personal genetic testing and analysis services. Announced a collaboration to equip its labs with Illumina microarray technologies.

### SELECT CUSTOMERS BY SEGMENT

Research

Translational

Clinical

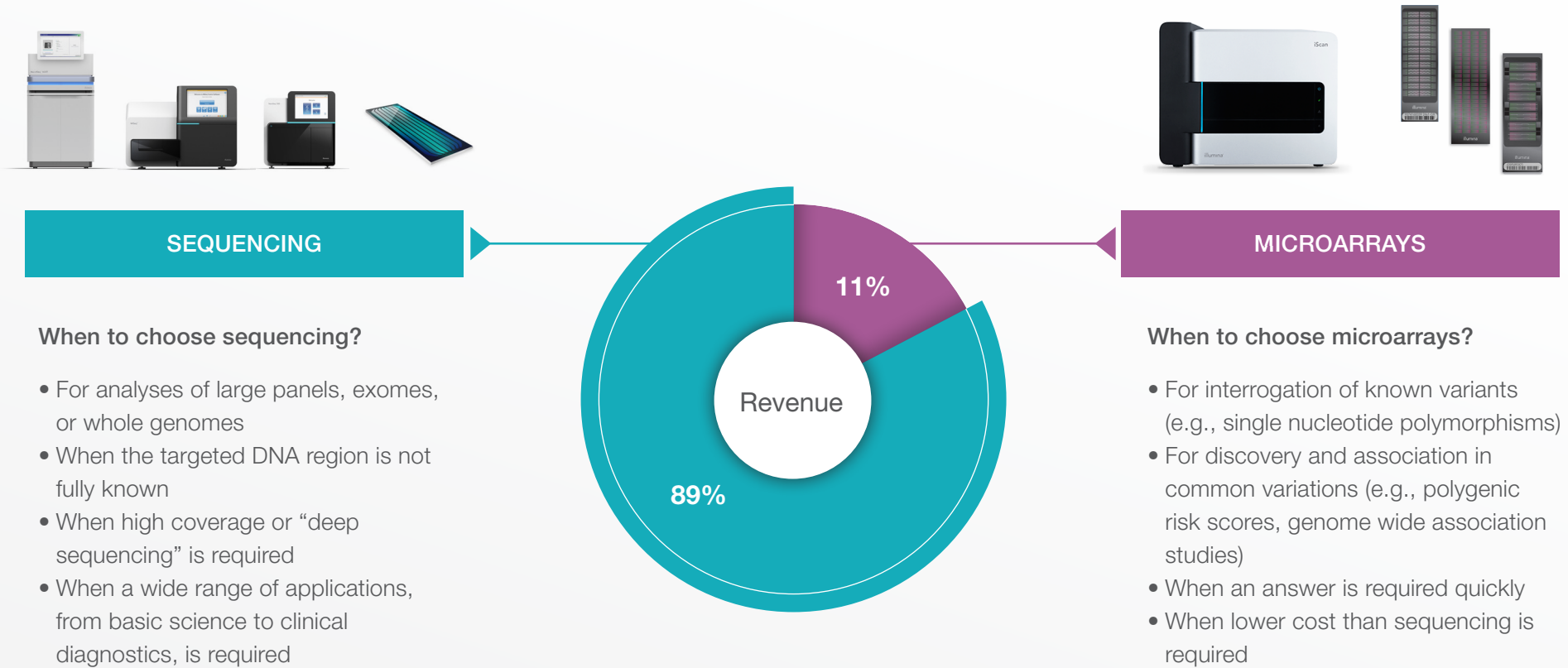
Consumer

Note: Select customer logos and descriptions are included with their respective approvals.

\*Excluding HiSeq, this includes all systems that have been shipped to customers and may include some decommissioned or inactive systems.

# ILLUMINA'S BUSINESS

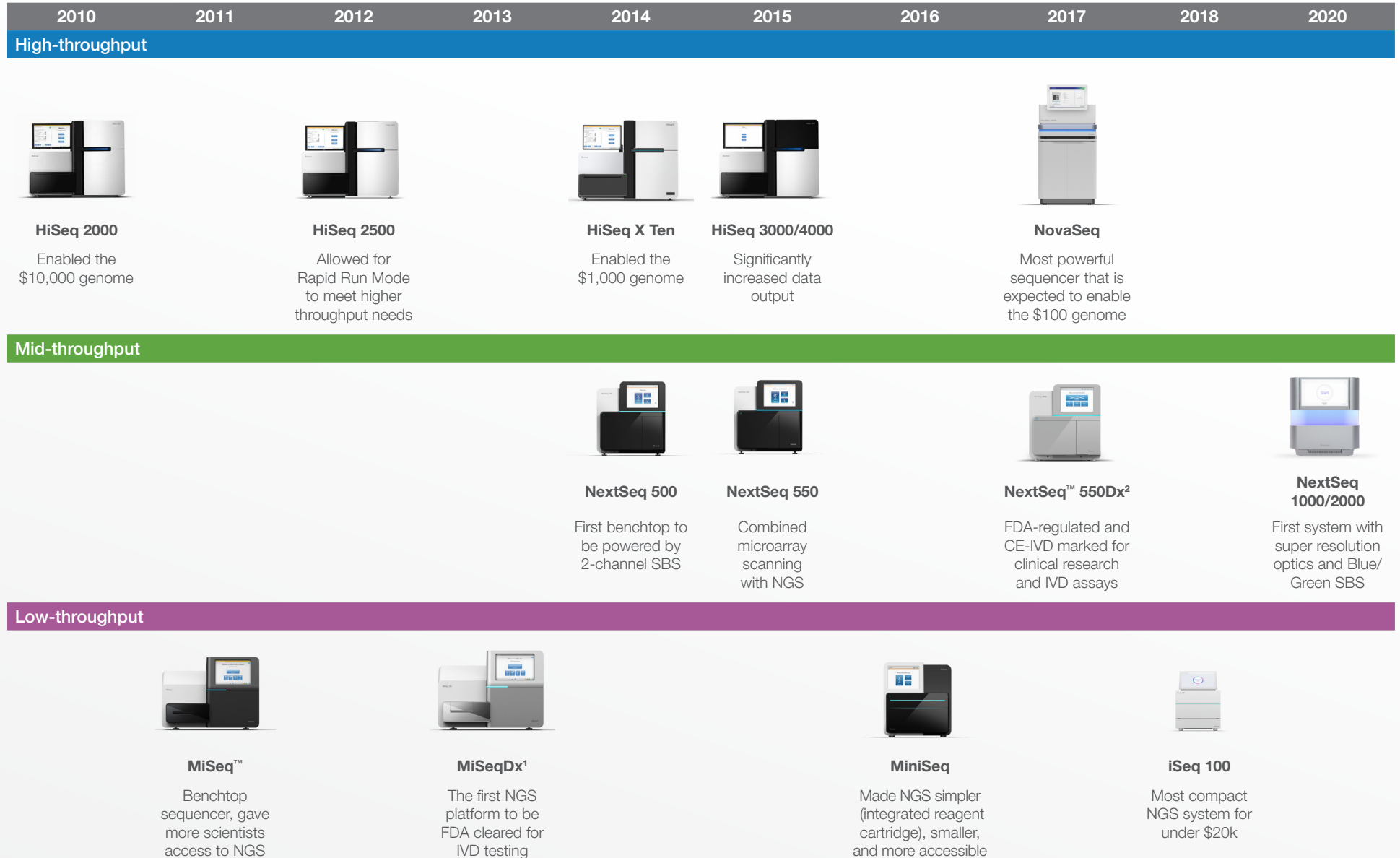
Illumina's revenues are comprised of two distinct genomic technologies: sequencing and microarrays.



Note: Revenue for Q220.



# HISTORY OF ILLUMINA'S SEQUENCING INNOVATION



<sup>1</sup> In August 2018, MiSeqDx sequencing system received the approval certificate from the China National Drug Administration (CNDA) and in January 2020, received approval from Japan's Pharmaceuticals and Medical Device Agency (PMDA) as a Class 1 medical device.

<sup>2</sup> In October 2018, NextSeq 550Dx received approval from Japan's PMDA as a Class 1 medical device.

# SEQUENCING SYSTEMS AND KEY APPLICATIONS OVERVIEW



	Large WGS (human, plant, animal)	Small WGS (microbe, virus)	Exome Sequencing	Targeted Gene Sequencing	Whole- Transcriptome Sequencing	Gene Expression Profiling with mRNA-Seq	Targeted Gene Expression Profiling
<b>High-throughput</b>							
NovaSeq	•		•		•		
<ul style="list-style-type: none"> <li>Broadest range of applications</li> <li>Enables lowest price per sample</li> </ul>							
HiSeq X Five/Ten	•						
<ul style="list-style-type: none"> <li>Enabled the \$1,000 Genome</li> </ul>							
HiSeq 2500/4000			•		•		
<ul style="list-style-type: none"> <li>Production-scale sequencing</li> </ul>							
<b>Mid-throughput</b>							
NextSeq 1000/2000		•	•	•	•	•	
<ul style="list-style-type: none"> <li>Incorporates blue/green SBS and super resolution optics</li> </ul>							
NextSeq 500/550		•	•	•	•	•	
<ul style="list-style-type: none"> <li>Flexible output options (mid and high)</li> </ul>							
<b>Low-throughput</b>							
MiSeq		•		•			
<ul style="list-style-type: none"> <li>First benchtop sequencer</li> </ul>							
MiniSeq		•		•			•
<ul style="list-style-type: none"> <li>&lt;1 day turnaround time</li> </ul>							
iSeq 100		•		•			
<ul style="list-style-type: none"> <li>Most affordable sequencer</li> </ul>							

Note: Only key applications highlighted, which does not reflect each system's entire set of capabilities.

# SEQUENCING PORTFOLIO DETAILS



	Instrument Price	Approx \$ Price/Gb	Max Output per Run <sup>1</sup>	Max Read Length	Max Reads per Run <sup>1</sup>	Time on Max Runs	Pull-Through Range	Flow Cell Technology	SBS Channels	Installed Base <sup>3</sup>
<b>High-throughput</b>										
NovaSeq 6000 with S4	\$985K	\$4.80	6 Tb	2 X 150 bp	20 billion	~44 hrs	\$1.1M-\$1.2M	Patterned	2	~920
NovaSeq 6000 with S2	\$985K	\$7.70	2 Tb	2 X 150 bp	6.6 billion	~36 hrs		Patterned	2	
NovaSeq 6000 with S1	\$985K	\$10.50	1 Tb	2 X 150 bp	3.2 billion	~25 hrs		Patterned	2	
NovaSeq 6000 with SP	\$985K	\$10.50	800 Gb	2 X 250 bp	1.6 billion	~38 hrs		Patterned	2	
HiSeq X	NA <sup>5</sup>	\$8	1.8 Tb	2 X 150 bp	6 billion	< 3 days	NA	Patterned	2	
HiSeq 4000	NA <sup>5</sup>	\$25	1.5 Tb	2 X 150 bp	5 billion	~3.5 days	NA	Patterned	4	~1,300 <sup>4</sup>
HiSeq 2500	NA <sup>6</sup>	\$38	1 Tb	2 X 125 bp <sup>2</sup>	4 billion	~60 hrs <sup>2</sup>	NA	Random	4	
<b>Mid-throughput</b>										
NextSeq 2000 with P3	\$335k	\$20	300 Gb	2 X 150bp	1 billion	~48 hrs	NA	Patterned	2	NA
NextSeq 1000 with P2	\$210k	\$30	120 Gb	2 X 150 bp	400 million	~29 hrs	NA	Patterned	2	NA
NextSeq 550	\$275K	\$41	120 Gb	2 X 150 bp	400 million	~30 hrs	NA	Random	2	~3,600
<b>Low-throughput</b>										
MiSeq	\$99K	\$108	15 Gb	2 X 300 bp	25 million	~56 hrs	\$40K-\$45K	Random	4	~7,400
MiniSeq	\$49.5K	\$225	7.5 Gb	2 X 150 bp	25 million	~24 hrs	\$20K-\$25K	Random	2	~1,100
iSeq	\$19.9K	\$521	1.2 Gb	2 X 150 bp	4 million	~19 hrs	NA	Patterned	1	~860

<sup>1</sup> Assuming two flow cells per run on NovaSeq and HiSeq Series Systems.

<sup>2</sup> Rapid run mode.

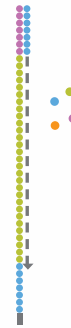
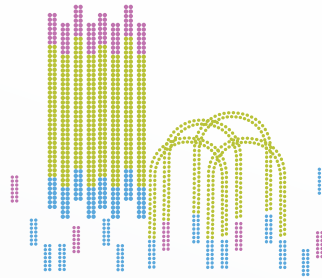
<sup>3</sup> As of end of 2019. Excluding HiSeq, this includes all systems that have been shipped to customers and may include some decommissioned or inactive systems.

<sup>4</sup> Combined HiSeq family.

<sup>5</sup> HiSeq X and 4000 instruments are no longer available for sale, but instruments and reagents will be supported through March 31, 2024.

<sup>6</sup> HiSeq 2500 instruments are no longer available for sale, but instruments and reagents will be supported through February 28, 2023.

# SEQUENCING WORKFLOW



## 1 Library preparation

- Before sequencing can take place, a sequencing library needs to be created which contains the DNA (or RNA) of interest to the experiment.
- During the library generation process, adapters will be added (usually via a process called ligation) onto both ends of the molecules of interest.
- These adapters are what enable cluster generation as well as what provide a unique barcode to uniquely identify libraries that may have been pooled together for sequencing.
- As such, many libraries may be pooled together to enable efficient use of the output of a single sequencing run.

## 2 Cluster Growth/ Generation

- Once prepared, libraries (or pools of libraries) are loaded into a flow cell in preparation for sequencing.
- Before clustering, libraries need to be denatured. Most Illumina systems use NaOH for library denaturation; however for iSeq, this process is automated and is performed inside the cartridge by the sequencer.
- Once denatured, DNA fragments can be captured on surface-bound oligos that are complementary to the library adapters. Each fragment is then amplified into distinct, clonal clusters through bridge amplification.

## 3 Sequencing

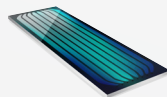
- Once a flow cell is clustered, sequencing can commence. First, all the molecules within a cluster are orientated into the same direction and denatured to allow the sequence primer (complementary to the adapters) to anneal.
- With the primer annealed, a polymerase enzyme is introduced and begins incorporating fluorescently labeled nucleotides (ddATP, ddGTP, ddCTP, ddTTP) which are complementary DNA bases of interest in the clusters.
- These ddNTPs are specially designed to halt synthesis after a single base is incorporated to ensure the synthesis of new strands is synced and the same length at the end of each cycle.
- At this point, the instrument excites the fluorescent labels on the newly incorporated nucleotide and captures an image of the flow cell. This image allows identification of the first base in the cluster.
- Illumina sequencing uses reversible termination that can turn a ddNTP into a regular dNTP, which allows the sequencing process to repeat and proceed one nucleotide at a time instead of being permanently halted.
- This process is repeated continuously, allowing identification of one base of the cluster each time the process repeats.

## 4 Data Analysis

- During sequencing, primary analysis is done on the instrument. This converts the images of the clusters into intensities and base calls.
- Post sequencing, secondary analysis begins. This involves additional software to generate alignments and then variant detection. Illumina offers this capability via its BaseSpace Sequence Hub.
- Once the variants have been identified during secondary analysis, tertiary analysis allows for annotation, filtering, and interpretation.

### What is a flow cell?

A flow cell is a glass slide with fluidic channels or lanes, where the sequencing chemistry occurs.



# MICROARRAYS OVERVIEW

## Background

### What is a microarray?

A microarray, or array, is a DNA chip that can be used to “genotype” multiple regions of a genome.

### What is genotyping?

The process of determining genetic variants in the genetic make-up of the DNA.

### How are array technologies used?

Array technologies continue to be used in a wide range of applications, including:

- Consumer genomics and health screening
- Agrigenomics
- Research (e.g., methylation testing)

## Overview



iScan

The Infinium workflow is run on the iScan system and is a highly robust, highly scalable end-to-end solution with automation compatibility.

- Starter Kit configurations to support the workflow and meet throughput targets.
- Optional Tecan liquid handling robot and Autoloader to support walk-away capabilities.
- Optional Infinium LIMS to implement positive sample tracking and workflow enforcement.

## Case Study<sup>1</sup>: NEOGEN

### Who?

Neogen genotypes more than 10,000 samples per day for livestock producers worldwide.

### How do they use microarrays?

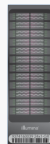
Neogen developed dozens of custom Infinium arrays to evaluate close to 50k markers, which allows livestock producers and breeders to selectively breed for superior animals.

### What's the impact?

This is especially important when the desired increases in genetic improvement are for traits that are not highly heritable, such as daughter pregnancy rate, for selecting the best dairy cattle bulls. The results for animal breeders include the elimination of genetic-based diseases.

## Key Microarrays

Illumina's portfolio of arrays can analyze from 100 to 5M variants. Select arrays below:



### Global Screening Array (GSA)

Built for consumer genomics and clinical research in translational and precision medicine efforts



### Infinium XT

Customizable with flexible content, ideal for agrigenomics and low plexity consumer genomics



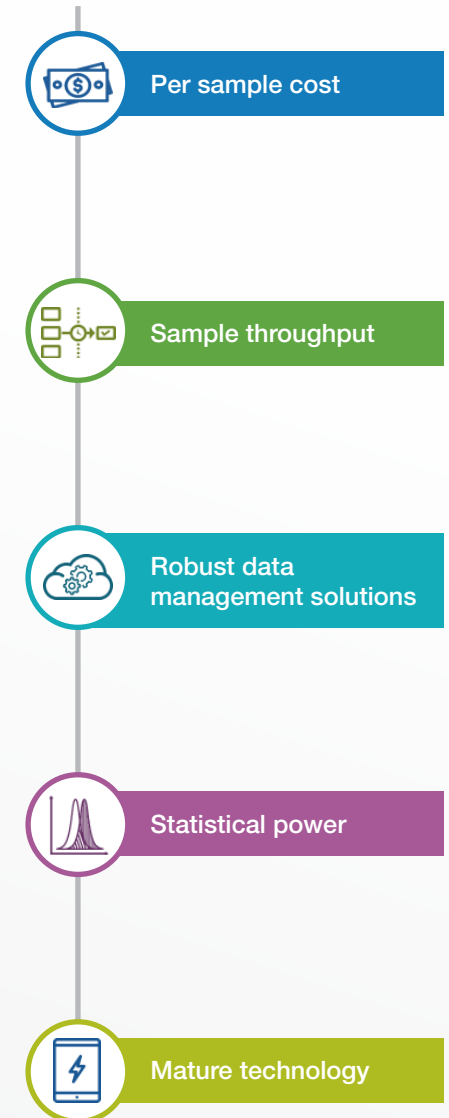
### Methylation EPIC Beadchip

Comprehensive genome-wide methylation coverage for research of genetic disease and oncology

## Fast Fact

In Q220, microarrays represented about 11% of revenues.

## Genotyping Advantages



<sup>1</sup>The case study is included with customer approval.



# ILLUMINA'S CLINICAL STRATEGY



## Enable Innovators

By providing industry-leading technology solutions, we enable our customers to continue to innovate and deliver clinical content, increase awareness, and drive adoption.



## Broaden Use

By developing distributable IVD kits in select clinical markets, we will broaden the reach of clinical sequencing. This will lower the barrier to adoption and enable labs of all sizes to run NGS-based samples in-house.



## Accelerate Reach

By partnering with leading clinical companies, we can accelerate patient access and increase impact. Working together, we will expand the clinical menu available on Illumina Dx platforms.



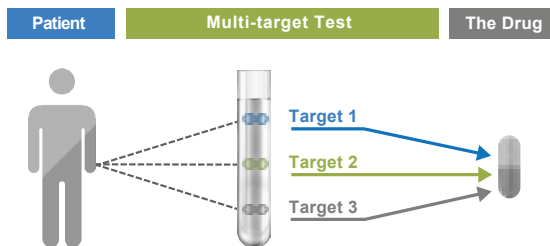
# FOCUS AREA: ONCOLOGY

## The Need

As cancer prevalence and costs rise, the need for effective patient stratification is driving research efforts to identify biomarkers and develop companion diagnostics.

- The number of new cancer cases is expected to increase to 24M per year by 2030<sup>1</sup>.
- In 2017, the national economic burden of cancer care in the US was estimated at \$137B<sup>2</sup>.

The goal is to go from single tests to comprehensive, multi-gene tests to fuel precision medicine.

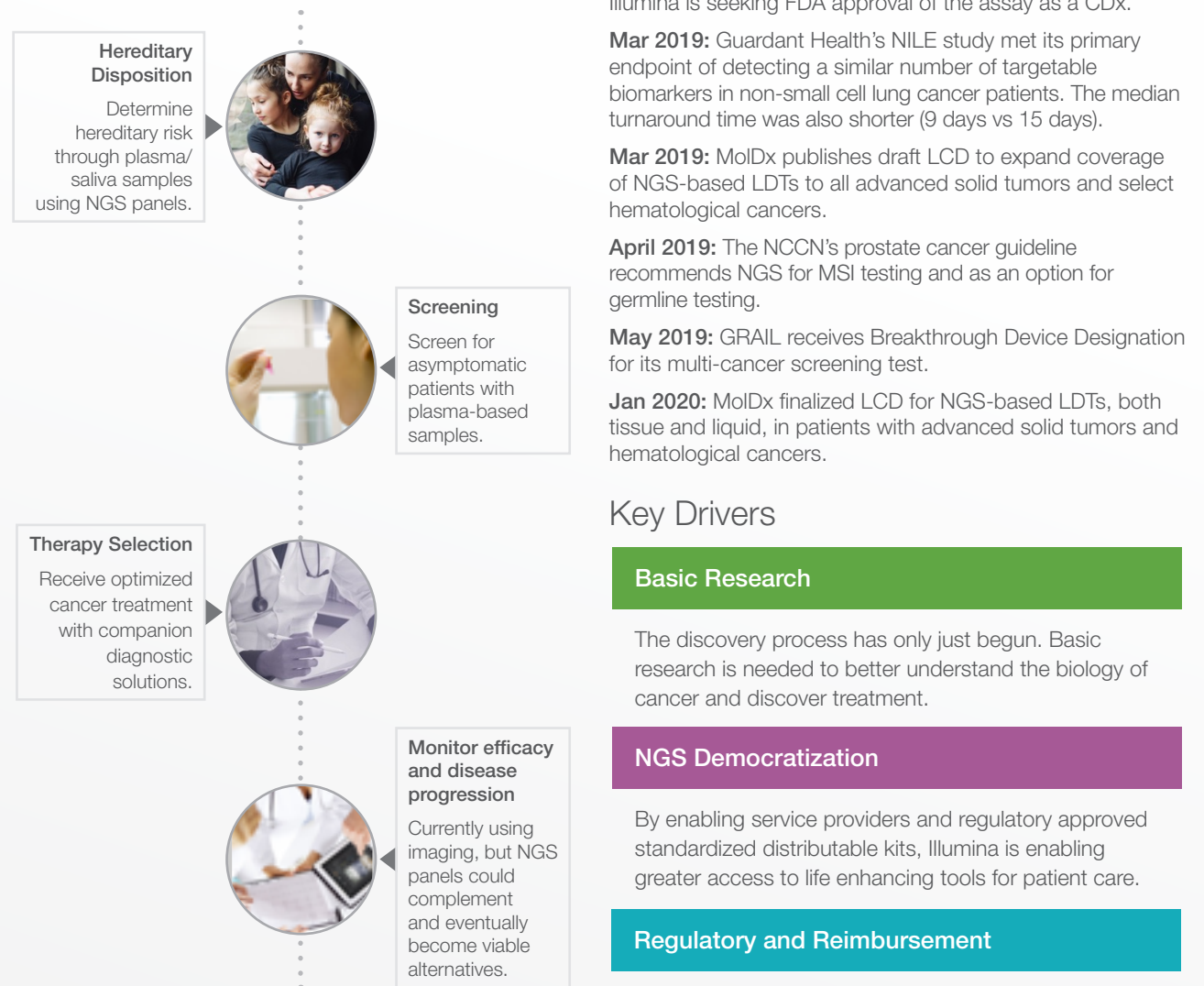


## Strategy

Illumina is committed to enabling our customers and industry partners to innovate on our technologies. Our goal is to provide each customer, ranging from research to translational to clinical, with targeted solutions that move NGS into the standard of care.

## Patient Journey

Overview for clinical testing



## Notable Developments

**Jan 2019:** Illumina announces its TruSight Oncology 500 assay has been granted Breakthrough Device Designation. Illumina is seeking FDA approval of the assay as a CDx.

**Mar 2019:** Guardant Health's NILE study met its primary endpoint of detecting a similar number of targetable biomarkers in non-small cell lung cancer patients. The median turnaround time was also shorter (9 days vs 15 days).

**Mar 2019:** MolDx publishes draft LCD to expand coverage of NGS-based LDTs to all advanced solid tumors and select hematological cancers.

**April 2019:** The NCCN's prostate cancer guideline recommends NGS for MSI testing and as an option for germline testing.

**May 2019:** GRAIL receives Breakthrough Device Designation for its multi-cancer screening test.

**Jan 2020:** MolDx finalized LCD for NGS-based LDTs, both tissue and liquid, in patients with advanced solid tumors and hematological cancers.

## Key Drivers

### Basic Research

The discovery process has only just begun. Basic research is needed to better understand the biology of cancer and discover treatment.

### NGS Democratization

By enabling service providers and regulatory approved standardized distributable kits, Illumina is enabling greater access to life enhancing tools for patient care.

### Regulatory and Reimbursement

Regulatory approval and reimbursement coverage of both small and large panels remain important for the uptake of companion diagnostics.

<sup>1</sup>International Agency for Research on Cancer as of September 2018.

<sup>2</sup>NIH National Cancer Institute as of February 2018.

# PRODUCT OVERVIEW: TRUSIGHT ONCOLOGY

## Overview

TruSight Oncology 500 is a next-generation sequencing assay for research use that enables comprehensive genomic profiling (CGP). It combines variant calling, TMB and MSI into a single test that provides reproducible results and works with low sample input.

### Illumina TSO500

Type	Tissue-based and ctDNA
Panel size	1.94Mb
# Genes tested	523
Sample input	40 ng or 5 FFPE slides
Turnaround time	3-4 days
RUO Launch Date	January 2019

## Comprehensive Genomic Profiling Benefits

CGP has several benefits over single or “hotspot” tests:

- Requires less sample input
- Allows targeting of a growing number of biomarkers in one test
- Enables a hypothesis neutral approach as opposed to ordering a test for each hypothesis
- Increases utilization of targeted therapies

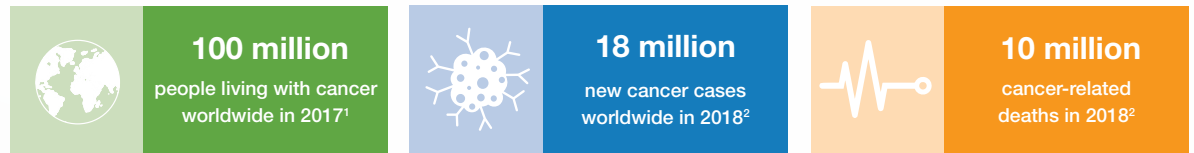
## What is TMB?

TMB stands for tumor mutational burden and it is the measurement of mutations carried by tumor cells. High TMB has been linked to better responses to immunotherapy.

In 2014 and 2015, two studies by MSK first demonstrated the connection between high TMB and response to immunotherapy. The studies showed the relationship for melanoma and non-small cell lung cancer. In January of 2019, MSK conducted another study and confirmed this relationship is true for many cancer types, not just melanoma or non-small cell lung cancer.

In June 2020 the FDA approved cancer treatment Keytruda with tumor mutational burden (TMB) as biomarker.

## Opportunity



Unfortunately very few tumors are sequenced (for example, only 8% of tumors have been sequenced globally). Combined with the growing number of clinical trials for immuno-oncology and approved immuno-therapies, CGP is expected to increasingly play a role for cancer treatment.

## Products In Development

### Companion Diagnostic

Illumina is actively partnering with pharma companies to develop a companion diagnostic (CDx) assay based on TSO500 content (planned to be branded as TSO Comprehensive). The FDA has granted this assay Breakthrough Device Designation, which means the review process will be expedited.

### Liquid Biopsy

Illumina has developed a version of TSO500 specifically for liquid biopsy samples. This TSO500 ctDNA assay is expected to be used when there is not enough sample tissue, or as a complementary assay for the tissue assay results.

As part of the development process, we partnered with Frederick National Laboratory (FNL) to establish the clinical utility for liquid biopsies in oncology testing. Using the TSO500 ctDNA, Illumina will work with FNL to:

- Perform a full analytical validation of the TSO500 ctDNA
- Investigate the concordance of ctDNA and tissue-based NGS
- Evaluate plasma specimens from subjects recruited into National Cancer Institute sponsored studies

<sup>1</sup>Our World in Data: <https://ourworldindata.org/cancer>

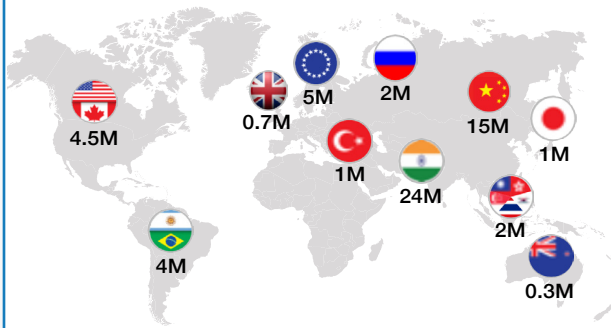
<sup>2</sup>World Health Organization: <https://www.who.int/cancer/PRGlobocanFinal.pdf>

# FOCUS AREA: NON-INVASIVE PRENATAL TESTING (NIPT)

## Opportunity

Non-invasive prenatal testing (NIPT) is a way of examining fetal DNA by taking a sample of blood from a pregnant woman. With 140M babies born globally each year, NIPT represents an exciting global opportunity with many geographies still in early stages of adoption.

### World Birth Rates<sup>1</sup>



## Strategy

Illumina hopes to facilitate the expansion of coverage to include average risk and enter new geographic markets. Additionally, Illumina is expanding the utility of screening by expanding the limits of NIPT technology to test for genetic abnormalities across the genome.<sup>2</sup>

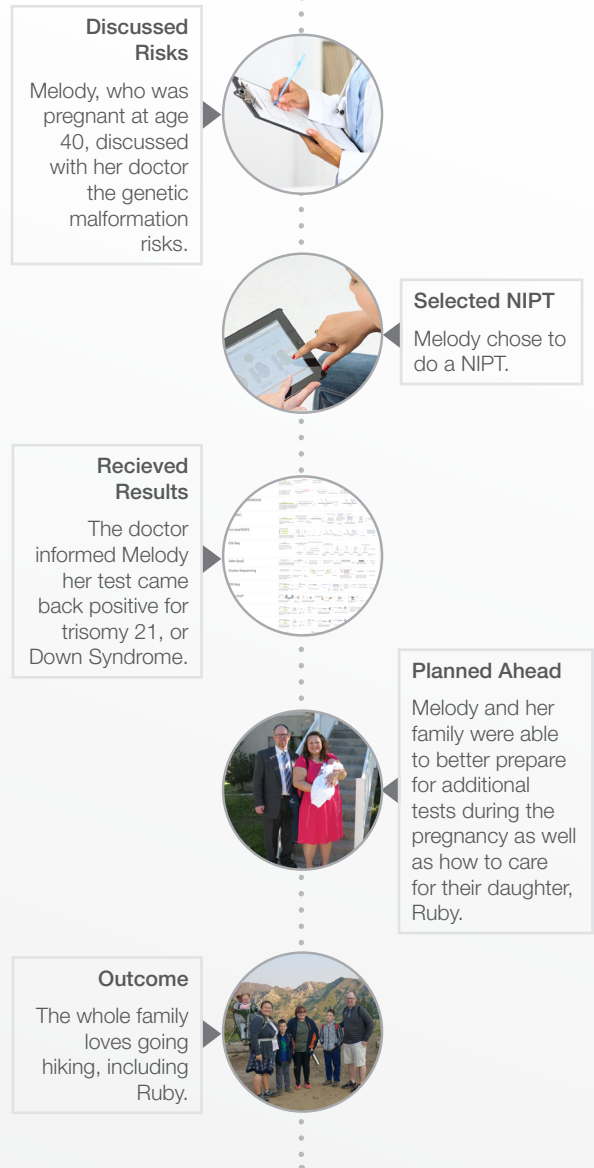
<sup>1</sup>World Bank population data, World Bank birth rate (2019)

<sup>2</sup>Abnormalities smaller than chromosomal have not been shown to be linked to maternal age and therefore the prevalence is equal across the population.

<sup>3</sup>The case study is included with patient approval.

## Case Study

Melody and Ruby's NIPT story<sup>3</sup>



## Notable Developments

**Sept 2018:** Florida Medicaid (~3.4M lives) becomes the first state to cover NIPT in all pregnant women.

**Dec 2018:** France publishes a reimbursement rate of €363 for NIPT testing to screen for Trisomy 21.

**June 2019:** Illumina launches VeriSeq NIPT Solution v2, enabling screening for a broader range of rare chromosomal conditions.

**Sept 2019:** Germany's Federal Joint Committee publishes its decision to cover NIPT for select high-risk pregnancies.

**Mar 2020:** Aetna (19.2M lives) temporarily provides coverage to all pregnancies during COVID-19 pandemic.

**Aug 2020:** ACOG bulletin supports NIPT for all pregnancies, regardless of risk.

## Key Drivers

### Reimbursement

In the US, 97% of high-risk pregnancies and 56% of average-risk pregnancies are covered. In the EU, the Netherlands and Belgium cover NIPT for all pregnancies.

### Regulatory Approval

With a CE-IVD mark in 2017, VeriSeq NIPT became accessible to 5M annual births. VeriSeq NIPT version 2 is now available in 33 countries (includes 30 IVD and 3 RUO) and undergoing product registration in an additional 3 countries. Illumina will continue to drive towards IVD in the US as well with TruSight NIPT.

### Clinical Value of NIPT

Most NIPT today screen for trisomy 21, 18, 13, X and Y. New solutions are driving expansion of testing to all autosomes and microdeletions. Expanding testing provides more clinical utility to the physician, especially for sub-chromosomal events that are equally prevalent independent of maternal age.

# PRODUCT OVERVIEW: VeriSeq NIPT v2

## A Whole Genome-Based Approach

Illumina's VeriSeq NIPT solutions are based on a whole genome sequencing (WGS) based assay, which uniquely provides millions of counts across the genome instead of being limited to just a few chromosomes. Since information is gathered based on whole fetal genome, this workflow approach lowers test failure rates, improves analysis, and enables all autosomes as well as CNV detection across the genome.

## Key Benefits of VeriSeq NIPT v2



### Amplification Free

WGS-based NIPT, such as VeriSeq NIPT v2, eliminates the need to amplify the sample. This minimizes contamination risk, reduces time and complexity, and removes the need for pre- and post-PCR space.



### Low Test Failure Rates

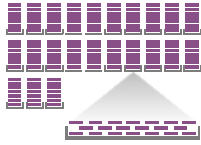

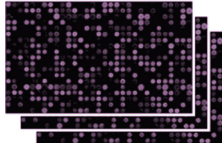
VeriSeq solutions use iFACT, an innovative quality control analysis that minimizes "failed" tests and enables more reporting on samples, even those with low fetal fraction.



### Expandable Test Menu

The WGS approach of VeriSeq NIPT allows for efficient expansion of test menu. VeriSeq NIPT v2 now offers a genome wide screen, which significantly expands the number of chromosomal abnormalities that are screened relative to basic NIPT.

## Overview of Technology Types

	WGS-based	Targeted Sequencing	Targeted Amplified Fluorescence	
				
<b>Examples of Test by Technology Type</b>	IONA, MaterniT21, NIFTY, VeriSeq NIPT v2*	Clarigo, Panorama	Harmony	Vanadis
<b>Select Technology Comparison</b>				
Examples	VeriSeq NIPT v2	Panorama	Harmony	Vanadis
Accuracy	>99%	>99%	>99%	>99%
Amplification Method	None	PCR-based	PCR-based	Rolling circle amplification
First-pass Failures Rate	1.2%	3.8%	~6%	<1%
Turnaround Time	~26 hours	3-4 days	3-4 days	3-4 days
Fetal Fraction	Reports, even for low fetal fraction	Does not report for low fetal fraction	Does not report for low fetal fraction	Does not measure fetal fraction
Test Menu				
Trisomy 21, 18, 13	Yes	Yes	Yes	Yes
Sex Chromosome Aneuploidies	Yes	Yes	Yes	No
Copy Number Variants	≥7Mb	Select Microdeletions	Select Microdeletions	No
All Autosomes	Yes	No	No	No

\*Sold under multiple brand names.

# FOCUS AREA: GENETIC DISEASES

## The Need

Whole genome sequencing can help better diagnose and treat rare, undiagnosed or genetic diseases as early transitions to clinical WGS show promising outcomes. Illumina's technology can have a meaningful impact on patient lives and we believe this market will serve as an important proof point for the need to perform WGS versus panels or even exomes as a first-tier test.

**>300M Rare Disease Patients<sup>1</sup>**  
**Average 8 Years to Diagnosis in the US & UK<sup>2</sup>**

Genetic diseases are responsible for:



<sup>1</sup>Nguengang Wakap, S., Lambert, D.M., Olry, A. et al. Estimating cumulative point prevalence of rare diseases: analysis of the Orphanet database. Eur J Hum Genet 28, 165–173.

<sup>2</sup><https://globalgenes.org/rare-facts/>

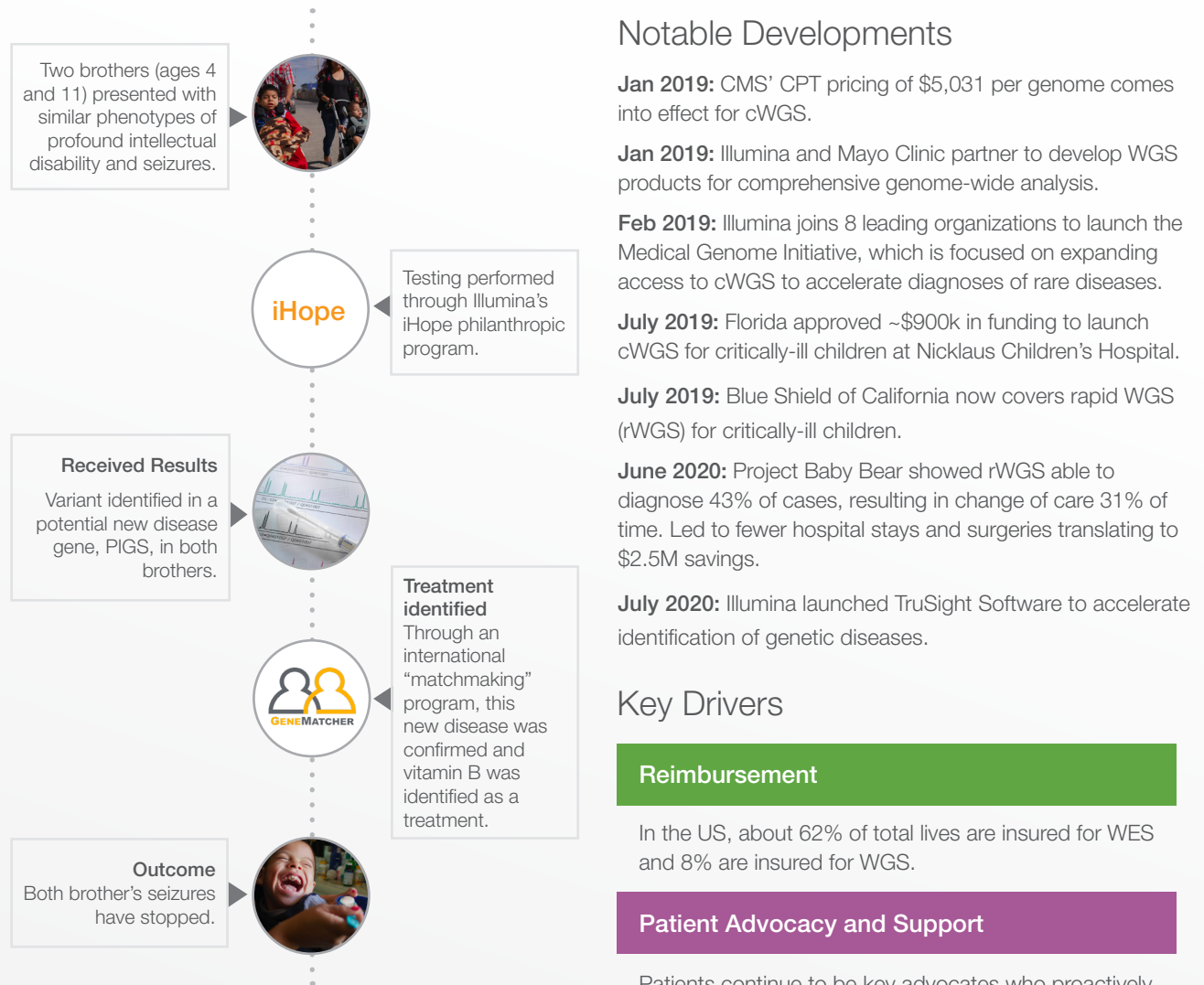
<sup>3</sup>Hudome SM, Kirby RS, Senner JW, Cunniff C. Contribution of genetic disorders to neonatal Soneda A, Teruya H, Furuya N, et al. Proportion of malformations and genetic disorders among cases encountered at a high-care unit in a children's hospital. Eur J Pediatr 2012;171:301-5

<sup>4</sup>O'Malley M, Hutcheon RG. Genetic disorders and congenital malformations in pediatric long-term care. J Am Med Dir Assoc 2007;8:332-4

<sup>5</sup>The case study is included with patient approval.

## Case Study

Two brothers' successful diagnosis<sup>5</sup>



## Strategy

Illumina hopes to catalyze and accelerate the adoption of cWGS for RUGD by driving best practices and standardization in cWGS to ensure high quality data.

## Notable Developments

**Jan 2019:** CMS' CPT pricing of \$5,031 per genome comes into effect for cWGS.

**Jan 2019:** Illumina and Mayo Clinic partner to develop WGS products for comprehensive genome-wide analysis.

**Feb 2019:** Illumina joins 8 leading organizations to launch the Medical Genome Initiative, which is focused on expanding access to cWGS to accelerate diagnoses of rare diseases.

**July 2019:** Florida approved ~\$900k in funding to launch cWGS for critically-ill children at Nicklaus Children's Hospital.

**July 2019:** Blue Shield of California now covers rapid WGS (rWGS) for critically-ill children.

**June 2020:** Project Baby Bear showed rWGS able to diagnose 43% of cases, resulting in change of care 31% of time. Led to fewer hospital stays and surgeries translating to \$2.5M savings.

**July 2020:** Illumina launched TruSight Software to accelerate identification of genetic diseases.

## Key Drivers

### Reimbursement

In the US, about 62% of total lives are insured for WES and 8% are insured for WGS.

### Patient Advocacy and Support

Patients continue to be key advocates who proactively request and seek cWGS for more accurate and timely diagnoses.



# FOCUS AREA: POPULATION GENOMICS

## The Need

Governments and health systems all over the world are recognizing the value of Population Genomics initiatives to improve the quality and efficiency of healthcare systems. Although large-scale population studies often take some time to scale, Illumina is excited about the long-term opportunities.

COVID-19 has disrupted some programs, but the following large-scale projects continue to progress:

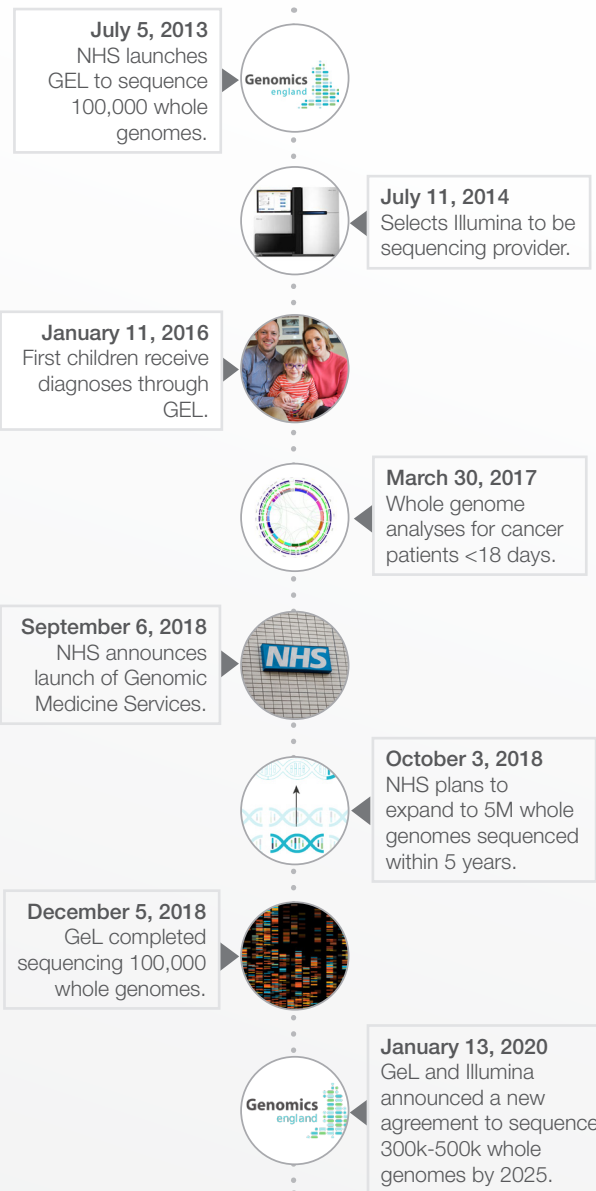
- UK Biobank
- NIH's All of Us Initiative
- Genomics England / NHS

## Vision and Strategy

Illumina's vision for Population Genomics is not only to enable one-time population research initiatives but to collaborate with governments and health systems to implement sequencing and incorporate new learnings into the standard of care. By enabling population health system programs, we can work to improve healthcare economics and patient outcomes.

## Case Study

Genomics England: 100,000 Genomes Project



## Notable Developments

**Sept 2018:** All of Us selects Baylor, Broad, and UW to serve as the three genome centers. They were awarded \$28.6M in funding. NIH also increased the All of Us FY2019 budget by \$82M to \$376M.

**Jan 2019:** Hong Kong announces its Genome Project to analyze 20,000 cases, which could lead to WGS of 40,000 to 50,000 genomes.

**May 2019:** Korea announces plans to sequence 1M individuals by 2029. Phase 1 is expected to start in 2020 and sequence 20,000 samples over 2 years.

**June 2019:** Intermountain Healthcare and deCODE genetics partner on Heredigene, a population study that plans to sequence 500,000 genomes.

**Sept 2019:** UK Biobank secures £200M in funding from a consortium which includes the UK government, Wellcome Sanger Institute, and four biopharma companies. The funds will be used to sequence the remaining 450,000 UK Biobank samples (first 50,000 samples were sequenced as part of the Vanguard Project).

**June 2020:** Personalis announced they've sequenced 75K genomes for the Million Veterans Program.

## Key Drivers

### Scalability

With more robust array and high-throughput sequencing technologies, government and health systems can now efficiently and effectively integrate genomic and clinical data of large populations to drive further discovery and innovation.

### Clinical Utility

As more discoveries are made in these initiatives, governments will increasingly see the clinical utility and health economic value of genomics.



# FOCUS AREA: CONSUMER GENOMICS

## Opportunity

Strong interest from individual consumers to learn about their genomics has fueled the growing direct-to-consumer (DTC) genomics market. It's still very early days, with only ~5% penetration<sup>1</sup>, and genealogy has been the overwhelmingly most common application. However, in the long term, we expect additional use cases in fitness, nutrition, wellness and health-related applications to drive excitement in consumer genomics.

## Expanding Applications

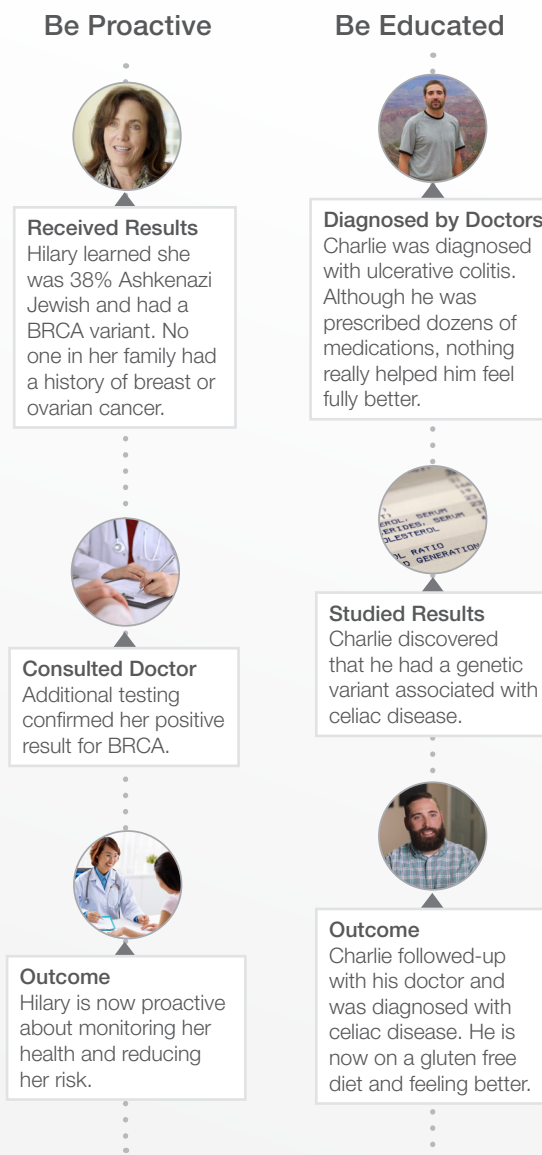


## Strategy

Illumina continues to support its customers by innovating technologies to make genotyping and sequencing even more affordable for DTC markets.

## Case Studies

23andMe customer stories<sup>2</sup>



## Notable Developments

**Oct 2018:** 23andMe receives FDA authorization to provide pharmacogenetic tests to consumers.

**Nov 2018:** WeGene will open its lab in Hong Kong, equipped with Illumina microarrays, to service customers in Hong Kong and Southeast Asia.

**Jan 2019:** 23andMe receives FDA authorization to provide customers with a genetic health risk report for hereditary colorectal cancer syndrome.

**Oct 2019:** Ancestry introduces two services (array-based and membership-based NGS service) under AncestryHealth to empower individuals to take proactive steps to address potential health risks.

**Jan 2020:** 23andMe licenses its first drug compound to Spanish drugmaker Almirall.

**Jan 2020:** 23andMe lays off 100 employees and cited a variety of factors, including privacy concerns, that contributed to the slowing market.

**Aug 2020:** Ancestry launches NGS offering to provide more comprehensive genetic screening.

## Key Drivers

### Affordability

As technologies have improved, consumer genomic tests have become much more affordable. In 2007, 23andMe launched their first testing service for \$999 and in 2020, now offers tests as low as \$99.

### Access

Until recently, consumer genomic companies had largely been focused on the US market. There has been significant growth and development abroad, notably in Asia Pacific (e.g., China, South Korea, Australia).

<sup>1</sup>Estimate according to Morgan Stanley, August 2018.

<sup>2</sup>These 23andMe customer case studies are included with both company and customer approvals.

# FOCUS AREA: COVID-19 AND INFECTIOUS DISEASE

Illumina has mobilized to support our customers and the broader community to address the coronavirus pandemic – from developing the first NGS based SARS-CoV-2 diagnostic to supporting large scale host-genomic research initiatives. Through both philanthropic donations and commercial collaborations, our goal is to ensure labs around the globe are equipped to fight this pandemic, and prevent future ones.

## Illumina Products and Workflows

**COVIDSeq** – First NGS-based test to receive EUA from the FDA to detect SARS-CoV-2.

**Respiratory Virus Oligo Panel** – Broad viral pathogen detection of SARS-CoV-2 and 40 other common viruses.

**Shotgun Metagenomics** – Allows researchers to sequence complex microbial samples to enable detection of both novel and known species.

## Notable Developments

**Jan 12, 2020:** First viral genome sequence, using an Illumina sequencer, made available<sup>1</sup>

**Mar 11, 2020:** WHO declares the coronavirus outbreak a pandemic<sup>2</sup>

**Jun 2020:** ILMN received EUA for COVIDSeq; <60 days from concept to authorization

**Aug 2020:** Helix, Ginkgo awarded NIH RADx funds to develop NGS-based COVID-19 tests

**Aug 23, 2020:** >23M confirmed cases and >800K deaths worldwide<sup>3</sup>

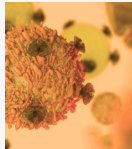
## Enabling the Full Spectrum of COVID-19 Applications



### Research

Understand host genetic risk factors, immune response, and disease progression

- GenOMICC
- CanCOGen
- COVID-19 Genomics Research Network



### Vaccine/Therapy Dev

Identify targets, screen antibodies, and stratify patients for clinical trials

- Moderna
- Adaptive



### Diagnostic

To identify the SARS-CoV-2 virus in symptomatic individuals

- COVIDSeq
- Helix



### Screening

Testing for asymptomatic populations to support back-to-school or – work programs

- Delaware State
- Octant



### Surveillance

Track transmission routes, identify co-infection trends, and understand viral adaptation

- SPHERES
- Africa CDCs

<sup>1</sup><https://www.ncbi.nlm.nih.gov/nuccore/MN908947.1>

<sup>2</sup><https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>

<sup>3</sup><https://coronavirus.jhu.edu/map.html>

# ILLUMINA ACCELERATOR DEVELOPS AND FOSTERS GENOMIC STARTUPS

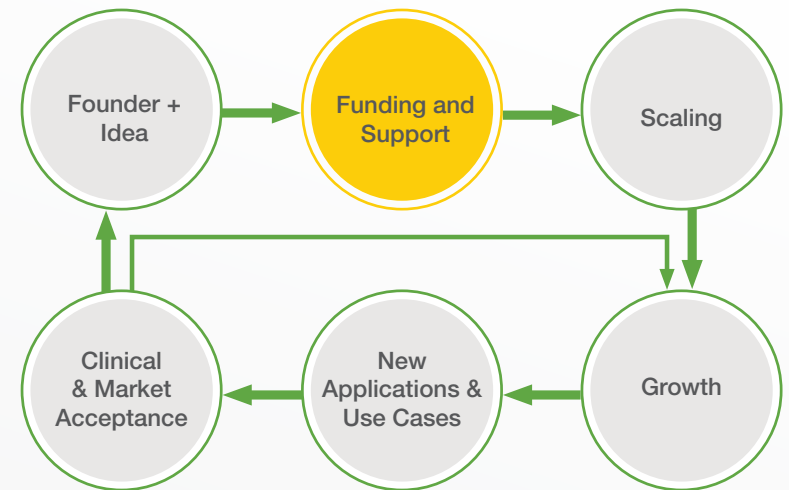
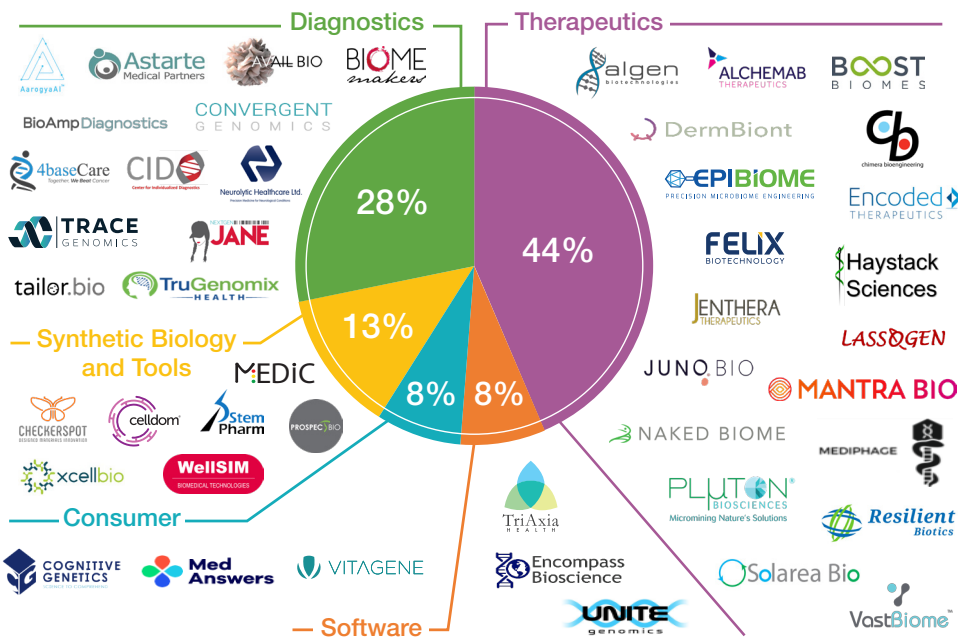
## Background

- Illumina Accelerator was founded in 2014 and expanded to Cambridge, UK in July 2019.
- **Mission:** Catalyze new genomics markets by partnering with entrepreneurs to unlock the power of the genome.
- **Leadership:** Leadership: Alex Aravanis, SVP and Chief Technology Officer, and Amanda Cashin, VP, Illumina Accelerator
- **Progress:** 45 startups have collectively raised over \$400M through June 2020.

## Goals

- Catalyze new markets and applications for NGS
- Attract VC investment into genomics by creating high quality genomics startups
- Recruit top entrepreneurs into genomics
- Gain technology insights for Illumina R&D

## Breakout by Investment Area



## How it Works

**Selection** – Twice a year, Illumina Accelerator evaluates applications from early stage genomics companies.

**Program** – Participants spend 6 months onsite for expert support in business and science, and also receive additional services, including capital and lab/office space.

**Graduation** – Upon graduation, Illumina Accelerator can help startups with additional fundraising. Participants are now part of a close-knit alumni community.

# ILLUMINA VENTURES HAS INVESTED IN 14 COMPANIES

## What is Illumina Ventures?

- Illumina Ventures is an independently managed firm focused on early-stage companies that are pioneering new applications of genomics and enabling precision medicine.
- It was launched with an initial \$100M investment from Illumina. The balance of the funds has been raised from a mix of corporate, institutional, sovereign, and individual investors.
- **Investment Areas:** Life science tools, clinical diagnostics, therapeutics, and other opportunities to improve human health.
- **First Fund Size:** \$230M (includes the \$100M investment from Illumina along with \$130M from additional investors).

## Key Facts

- Launched: 2016
- Founding Partner: Nicholas Naclerio, Ph.D., Illumina's former SVP, Corporate and Venture Development
- Portfolio companies have collectively raised over \$994M as of June 30, 2020
- As of December 29, 2019, the remaining commitment is \$51M from Illumina

## Portfolio by Current Stage

### Seed and Series A

- Cernostics** is a leader in tissue-based diagnostic testing, providing diagnostic tests with deeper tissue insights.
- Cradle Genomics** is developing a non-invasive prenatal test that will detect genetic abnormalities more broadly and comprehensively.
- Luna DNA** enables people to share their health data for medical research for the greater good of the community.
- Ribometrix** is a platform therapeutics company discovering small molecule drugs that target functional 3D RNA structures to treat human diseases.
- SerImmune** reveals the components of functional immune repertoires for therapeutic and diagnostic development.
- Stilla Technologies** focuses on accelerating the development of next-gen genetic tests by providing a ground-breaking and flexible digital PCR solution.

### Series B

- Biota** applies DNA sequencing and data science to explore the earth's subsurface and provide actionable insights to the oil industry for maximizing reservoir production and reducing environmental impact.
- DNA Script** is a leading company in manufacturing de novo synthetic nucleic acids using an enzymatic technology.
- Genome Medical, Inc.** is a network of clinical genetics experts integrating genomics into everyday health care.
- KALLYOPE** **Kallyope** is focused on the identification of new therapeutic and consumer opportunities involving the gut-brain axis, the information highway between our gut and our brain.
- NanoCollect** develops microfluidic technology for cell based assays.

### Series C

- Encoded Therapeutics** is harnessing the regulatory genome to create next-generation molecular therapies.
- SQZ Biotechnologies** is a cell therapy company developing novel treatments for multiple therapeutic areas.
- Publicly Traded**
- Twist Bioscience** is accelerating science and innovation by leveraging proprietary semiconductor-based synthetic DNA manufacturing process to deliver cost-effective, rapid, high-quality and high throughput gene production.

Note: Quarterly financial information is unaudited.

# KEY CORPORATE TRANSACTIONS AND PARTNERSHIPS

ACQUISITIONS			
Name	Date	Detail	
<b>Enancio</b>	Jul 2020	Acquisition of data compression company to streamline the informatics bottlenecks in the sequencing workflow	
<b>BlueBee</b>	Jun 2020	Acquisition to further expand Illumina's informatics capabilities with regulatory compliant, cloud-based software platform	
<b>Edico Genome</b>	May 2018	\$100M acquisition. Edico's DRAGEN platform will complement and enhance interpretation and reporting capabilities	
<b>Verinata Health</b>	Jan 2013	Acquisition of Verinata Health for \$350M gives Illumina access to NIPT and IP portfolio	
<b>Epicentre Biotechnologies</b>	Jan 2011	Acquisition of Epicentre's Nextera technology to enhance NGS library prep for \$90M	
<b>Solexa</b>	Nov 2006	Acquisition of Solexa for \$650M gives Illumina the technology to enter the NGS space	
DIVESTITURES			
Name	Date	Detail	
<b>Vitrolife</b>	Oct 2018	Licensing and commercialization agreement for exclusive distribution, development and commercialization rights to Illumina's PGT business for IVF in EMEA and Americas for \$13M and up to additional \$3M	
<b>CareDx</b>	May 2018	Licensing and commercialization agreement to be the exclusive worldwide distributor of Illumina's TruSight HLA v1 and v2 and Assign HLA software. In January 2017, CareDx acquired Conexio from Illumina	
<b>Verogen</b>	Aug 2017	Illumina partnered with Telegraph Hill Partners to launch Verogen, a forensic genomics spin-off	
SELECT RECENT PARTNERSHIPS			
Name	Date	Detail	
<b>Roche</b>	Jan 2020	To develop and globally commercialize IVD kits on Illumina Dx systems and to add new CDx claims to TSO500	
<b>QIAGEN</b>	Oct 2019	To develop and globally commercialize IVD kits, including CDx, on Illumina Dx systems	
<b>Adaptive</b>	Sep 2019	To develop immunodiagnostic IVD test kits on the NextSeq 550 Dx System in the U.S.	
<b>AnchorDx</b>	Jun 2019	To develop clinical oncology products for the Chinese market on the MiSeq Dx System	
<b>Sysmex</b>	Jan 2019	To commercialize an oncology IVD panel in Japan. Sysmex's 114 gene panel will run on NextSeq550 Dx System	
<b>PierianDx</b>	Jan 2019	To support variant interpretation and reporting for select Illumina oncology products	
<b>GeneSeq</b>	Jun 2018	To develop an oncogene detection kit and accelerate the commercialization of NGS testing in cancers across China	
<b>BMS</b>	Apr 2018	To add companion diagnostic claims to TruSight Oncology 500 in support of BMS oncology portfolio	
<b>Bayer (prev. Loxo)</b>	Apr 2018	To develop a pan-cancer CDx for NTRK gene fusions. The CDx will seek FDA approval on the NextSeq 550Dx platform	
<b>Loxo (subsidiary of Eli Lilly)</b>	Apr 2018	To develop a CDx for RET gene alterations in thyroid and lung cancers. The CDx will seek FDA approval on the NextSeq 550Dx platform	



# ILLUMINA LABORATORY SERVICES

## Overview

Illumina Laboratory Services (ILS) offer its customers services globally through three locations:

- **ILS - San Diego and Foster City**

The team based in California, USA supports high throughput NGS for clinical testing (rare and undiagnosed disease, non-invasive prenatal screening, oncology comprehensive genomic profiling) and array genotyping. Samples for the iHope program are also run in ILS - San Diego.

- **ILS - United Kingdom**

The team based in the UK supports high throughput human genome sequencing and delivered data for the 100K Genomes Project via a contract between Illumina and Genomics England.

## Strategy

Illumina Laboratory Services (ILS) is designed to drive adoption of clinical genomic solutions by translating Illumina products for clinical laboratory use and accelerate the adoption of new platforms and products.



## Why Customers use ILS

- Genomic experience since 2002
- High throughput, fully automated and LIMS tracked
- CLIA, CAP and ISO certified
- 3 locations and over 300 employees
- Board-certified pathologist, medical geneticists, genetic counselors, Ph.D. scientists
- Lab operations, engineering, software, supply chain, quality, and customer service

## Fast Fact

Revenue associated with ILS is included in our Service and Other category.



# MANUFACTURING OVERVIEW

Illumina is committed to its manufacturing processes through continual improvement by maintaining the effectiveness of our quality management system and complying with regulatory requirements.



**Hayward, CA**  
Instrument manufacturing



**Madison, WI**  
Enzyme manufacturing



**San Diego, CA**  
Launch pad for new consumables and IVD products



**Singapore**  
Instrument and consumables manufacturing  
Manufactures at high volume



## Background

Main Sites: 4

Total sq footage: ~300,000

Global employees: ~1,400

Developing robust manufacturing capabilities is an integral part of Illumina's ability to deliver consistent, high-quality products on-time. Over the past few years, Illumina has begun a series of manufacturing expansion plans to promote business continuity with each site serving a strategic purpose. For instance, San Diego's manufacturing site allows for enhanced interactions and workflows between R&D and manufacturing.

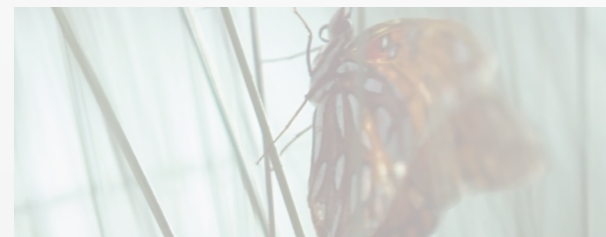
# PRESS RELEASES

06-Aug-20	Announces the NovaSeq 6000 v1.5 Reagent Kit Unlocking Deeper Discoveries with the \$600 Genome
08-Jul-20	Launches TruSight Software Suite to Accelerate the Identification of Genetic Diseases
23-Jun-20	Illumina Accelerator Welcomes First Global Cohort of Genomics Startups
17-Jun-20	Acquires BlueBee to Accelerate Processing, Analysis and Sharing of Next Generation Sequencing Data at Scale
16-Jun-20	Announces that U.S. Federal Court Issues Preliminary Injunction Against BGI
09-Jun-20	Receives First FDA Emergency Use Authorization for a Sequencing-Based COVID-19 Dx Test
18-May-20	Commits \$10 Million to COVID-19 Response and Research with ILMN Foundation
04-May-20	Welcomes Alex Aravanis as CTO and Appoints Mostafa Ronaghi to Lead Entrepreneurial Dev.
28-Apr-20	Donates to the Africa Centre for Disease Control and Prevention for Sequencing-Based COVID-19 Surveillance
16-Apr-20	Illumina Makes Software Toolkit Available Free of Charge to Support Worldwide Efforts to Combat COVID-19
27-Feb-20	Files Additional Patent Infringement Suit Against BGI in the U.S.
6-Feb-20	Names Dr. Scott Gottlieb to Board of Directors
13-Jan-20	Partners with Roche To Broaden Patient Access to Genomic Testing
10-Jan-20	Files Patent Infringement Suit Related to BGI in Sweden and UK
2-Jan-20	Termination of Merger Agreement with PACB
7-Oct-19	Partners with QGEN to Deliver NGS IVD Tests
30-Sept-19	Co-Develop Genomic Secondary Analysis Tools with Broad Institute
9-Sept-19	Names Joydeep Goswami SVP of Corporate Development and Strategic Planning
16-Jul-19	Expands Genomics Accelerator to Cambridge, UK
28-Jun-19	Files Patent Infringement Suit Related to BGI in Switzerland, Turkey, and US
17-Jun-19	Wins Infringement Suit Against Ariosa Diagnostics, Inc.
4-Jun-19	Introduces Expanded Version of VeriSeq NIPT Solution
15-May-19	Files Patent Infringement Suit Against BGI in Denmark
29-Mar-19	Files Patent Infringement Suit Against BGI in Germany

26-Mar-19	Partners with Lundbeck Foundation Geogenetics Center
6-Feb-19	Names Susan E. Siegel to Board of Directors
6-Dec-18	Announces New Genotyping Array and Scientific Contribution to Support All of Us
1-Nov-18	Announces Acquisition of PACB for \$1.2B
30-Oct-18	Launches TruSight Oncology 500 to Power Pan-Cancer Tumor Profiling
28-Sep-18	Announces Conversion Period for Convertible Senior Notes due 2019 and due 2021
27-Aug-18	Receives Approval of MiSeqDx System in China
16-Aug-18	Announces Pricing of Convertible Senior Notes
15-Aug-18	To Offer \$650 Million Convertible Senior Notes
15-May-18	Acquires Edico Genome to Accelerate Genomic Data Analysis
13-Apr-18	Announces Collaboration with BMS to Develop CDx for IO Therapies
10-Apr-18	To Partner with Loxo Oncology on NGS-Based Pan-Cancer CDx
12-Mar-18	Names Dr. Phil Febbo Chief Medical Officer
26-Jan-18	Awarded \$26.7M in Patent Suit Against Ariosa Diagnostics, Inc.
8-Jan-18	Agreement with TMO to Provide Access to Ion AmpliSeq Technology
8-Jan-18	Launches iSeq 100 Sequencing System
4-Jan-18	Partners with KingMed Diagnostics to Develop NGS Tech for Chinese FDA Approval
11-Dec-17	Names Aimee Hoyt Chief People Officer
29-Nov-17	Opens Commercial and Customer Training Center in France
21-Nov-17	Wins Infringement Suit Against Premaitha Health plc and Ariosa Diagnostics, Inc.
15-Nov-17	Introduces NextSeq 550Dx System and Expanded Use of MiSeqDx System
8-Nov-17	Names Gary S. Guthart, Ph.D., to Board of Directors
16-Oct-17	Releases NovaSeq S4 Flow Cell and NovaSeq Xp Workflow
7-Sep-17	Files New Patent Infringement Suit Against Premaitha Health plc

## Quarterly Press Releases

6-Aug-20	Reports Q2 2020
30-Apr-20	Reports Q1 2020
14-Apr-20	Reports Preliminary Q1 2020 Results
29-Jan-20	Reports Q4 and FY19 Results
24-Oct-19	Reports Q3 2019
29-Jul-19	Reports Q2 2019
11-Jul-19	Announces Preliminary Q2 2019 Results
25-Apr-19	Reports Q1 2019
29-Jan-19	Reports Q4 and FY18 Results
23-Oct-18	Reports Q3 2018
30-Jul-18	Reports Q2 2018
24-Apr-18	Reports Q1 2018
30-Jan-18	Reports Q4 and FY17 Results
24-Oct-17	Reports Q3 2017
1-Aug-17	Reports Q2 2017
25-Apr-17	Reports Q1 2017
31-Jan-17	Reports Q4 and FY16 Results
1-Nov-16	Reports Q3 2016
10-Oct-16	Announces Preliminary Q3 2016 Results
26-Jul-16	Reports Q2 2016
3-May-16	Reports Q1 2016
18-Apr-16	Announces Preliminary Q1 2016 Results



# EXECUTIVE TEAM



**Francis deSouza**  
President and CEO

Francis deSouza was appointed President & CEO of Illumina in 2016 and is responsible for directing all aspects of company strategy, planning, and operations. He initially joined the company as President in 2013, and led Illumina's business units and core functions responsible for envisioning, developing and producing the company's products.

Previously, Mr. deSouza served as President of Products and Services at Symantec Corporation, where he was responsible for driving the vision for the company's market-leading portfolio and served in a variety of executive roles. He joined Symantec through the acquisition of IMlogic, where he was co-founder and CEO.

Prior to joining IMlogic, Mr. deSouza was co-founder and CEO of Flash Communications, a provider of corporate instant messaging that was acquired by Microsoft. Following the acquisition, he joined Microsoft and led the team responsible for the development of the company's enterprise real-time collaboration offerings. Currently, he is a member of the Board of Directors for The Walt Disney Company.



**Sam Samad**  
SVP, Chief Financial Officer

Sam Samad joined Illumina in 2017 and holds the role of SVP and Chief Financial Officer with responsibility for the company's finance, accounting, investor relations, internal audit, treasury, facilities and global information systems functions.

Before joining Illumina, Mr. Samad held several senior leadership positions at Cardinal Health including Senior Vice President and Corporate Treasurer, leading all tax and treasury functions. During his tenure as Treasurer, he also had operational and financial responsibility for Cardinal Health's China business. Prior to that, Mr. Samad served as Senior Vice President and Chief Financial Officer for Cardinal Health's \$85B pharmaceutical segment, among other leadership roles. Prior to Cardinal Health, Mr. Samad spent thirteen years at Eli Lilly and Company, in a variety of sales and finance roles, both domestically and internationally, including his role as Chief Financial Officer of the Canada affiliate prior to leaving Eli Lilly. Samad started his career at Pepsico Inc.

Mr. Samad is a member of the Board of Directors for IDEXX Laboratories, Inc., a global leader in veterinary diagnostics, veterinary practice software and water microbiology testing and is also a member of the Board of Visitors at the Owen Graduate School of Management.



**Dr. Alex Aravanis, MD, PhD**  
SVP, Chief Technology Officer

Alex Aravanis MD PhD joined Illumina in June 2020. As Senior Vice President and Chief Technology Officer, he is responsible for leading Illumina's research and technology development functions and the innovation engine for next-generation sequencing platforms and applications, accelerating technology breakthroughs and translation to the clinic.

Aravanis is an experienced entrepreneur and was involved in founding several start-ups in the life sciences and health care. Most recently, he co-founded GRAIL Bio where he served as Chief Scientific Officer and Head of R&D. At GRAIL, Aravanis led the research, development, operational, and clinical teams developing its multi-cancer early detection test.

Prior to GRAIL, Aravanis served as Senior Director of R&D for Illumina, Inc., where he developed multiple technologies, including clinical assays for the analysis of RNA and DNA from fixed tissues, whole exome analysis, massively parallel single cell transcriptomics, and liquid biopsy using cell-free nucleic acids.

Alex earned BS in Electrical Engineering, Computer Science, and Physics Minor from the University of California, Berkeley, as well as an MS and PhD in Electrical Engineering, and an MD from Stanford University. He holds more than 30 (pending and issued) patents and numerous peer-reviewed publications.

# EXECUTIVE TEAM



**Charles Dadswell**  
SVP, General Counsel

Charles Dadswell is Senior Vice President, General Counsel and Secretary to the Board of Directors of Illumina, where he has worldwide responsibility for global legal and intellectual property matters. He is also Chief Compliance Officer and President of the Illumina Foundation.

Before joining Illumina, Mr. Dadswell was Vice President, General Counsel for North and Latin America and Corporate Director of Global Intellectual Property at the French diagnostic company bioMerieux. He was previously General Counsel of BioDelivery Sciences International, a specialty pharmaceutical company. Prior to that appointment, Mr. Dadswell, spent 15 years at Glaxo, GlaxoWellcome and GlaxoSmithKline, in a variety of positions and oversaw US intellectual property procurement and enforcement. Prior to joining Glaxo, he was a patent attorney for Proctor & Gamble. Previous to that Mr. Dadswell worked for Glaxo as a hospital sales representative.



**Dr. Phil Febbo**  
SVP, Chief Medical Officer

Dr. Phil Febbo was appointed as Chief Medical Officer in March 2018. In this role, he is responsible for developing and executing the Company's medical strategy to drive genomic testing into healthcare practice. Dr. Febbo has a successful track record of translational research, clinical excellence, and for embedding molecular insights into clinical care.

Before joining Illumina, Dr. Febbo served as CMO of Genomic Health. Before Genomic Health, Dr. Febbo was a Professor of Medicine and Urology at the UCSF.

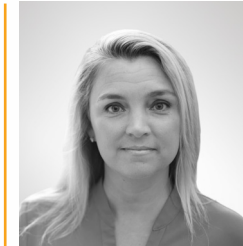
Before joining the faculty of UCSF as an associate professor in 2010, Dr. Febbo worked at Duke University Medical Center's Institute of Genome Sciences and Policy. He completed his internal medicine residency at the Brigham and Women's Hospital, and his fellowship in oncology at the Dana-Farber Cancer Institute. After, he was an Attending Physician in the Genitourinary Oncology Center at Dana-Farber, Instructor at Harvard Medical School, as well as a post-doctoral fellow at Dana-Farber and the Whitehead Institute Center for Genomic Research of MIT (now the Broad Institute).



**Joydeep Goswami, PhD**  
SVP, Corporate Development and Strategic Planning

Joydeep Goswami is Senior Vice President of Corporate Development and Strategic Planning where he responsible for driving planning, strategic partnerships and acquisitions.

Most recently, he served as the President of Thermo Fisher Scientific's Clinical NGS and Oncology business unit, where he oversaw efforts that drove the adoption of NGS in clinical oncology, research and reproductive health. Goswami has held senior leadership roles across the pharma/biotech, diagnostics and research tool continuum, previously serving at companies such as Life Technologies and Invitrogen, in addition to Thermo Fisher Scientific. He has led teams across various functions, including sales, marketing, R&D and other support functions. Mr. Goswami served as President, Asia Pacific and Japan while at Thermo Fisher Scientific and created the Stem Cells and Regenerative Medicine Business Unit at Invitrogen. Additionally, he spent five years at McKinsey, where he specialized in strategy for pharmaceutical, medical technology and technology companies.



**Aimee Hoyt**  
SVP, Chief People Officer

Aimee Hoyt is Senior Vice President and Chief People Officer at Illumina, where she is responsible for all aspects of the company's HR strategies. Ms. Hoyt has a successful track record for leading workforce transformation, driving business growth and creating high-impact teams.

Previously, she has held senior positions at some of the world's best-known technology companies including Hewlett-Packard, Cisco and Sun Microsystems.

Most recently, Ms. Hoyt was the Chief Human Resources Officer at Rackspace, a leading managed cloud computing company, in San Antonio, Texas. She led the HR team and was responsible for helping build, align and develop high-performing global teams. During her tenure, Rackspace was recognized as one of Fortune's 100 Best Companies to Work For, Top 30 Best Places in Tech and Great Places to Work for Millennials.



# EXECUTIVE TEAM



**Bob Ragusa**

SVP, Global Quality and Operations

Bob Ragusa is Senior Vice President of Global Quality & Operations for Illumina where he is responsible for the company's operations serving clinical and research customers. His organization includes the Manufacturing, Supply Chain, Quality, and Life Cycle Management global teams who are committed to ensure high product quality and customer satisfaction.

Prior to joining Illumina, Mr. Ragusa was Executive Vice President of Engineering and Global Operations at Accuray, a radiation oncology company, where he and his team were responsible for the development, manufacturing and distribution of innovative precision treatment solutions. Mr. Ragusa served as Senior Vice President of Global Operations for Applied Biosystems from 1997 until 2005.

Mr. Ragusa currently serves on Board of Directors for Twist Biosciences.



**Mostafa Ronaghi, PhD**

SVP, Entrepreneurial Development

Mostafa Ronaghi, Ph.D., joined Illumina in August 2008. As Senior Vice President and Chief Technology Officer, he is responsible for leading internal research and technology development (RTD) and is co-founder of Illumina Accelerator, the world's first business accelerator focused solely on creating an innovation ecosystem for the genomics industry.

Mr. Ronaghi, an experienced entrepreneur, most recently led the formation internally at Illumina of GRAIL Bio. Previously, Ronaghi co-founded several companies including: Avantome, a sequencing company acquired by Illumina in 2008; NextBio, a search engine for life science data acquired by Illumina in 2013; ParAllele Bioscience acquired by Affymetrix; and Pyrosequencing AB, which was renamed to Biotage in 2003, and had a successful IPO in 2000 on the Stockholm Stock Exchange.

Mr. Ronaghi was a principal investigator at Stanford University from 2002 until 2008 and focused on development of novel tools for molecular diagnostic applications. He serves on the board of directors of BaseHealth and Clear Labs. He is also a member of the Scientific Advisory Board of GRAIL Bio.



**Susan Tousi**

SVP, Chief Product Officer

Susan Tousi is Senior Vice President of Product Development at Illumina, where she is responsible for global engineering, consumables, sequencing applications, software and informatics development efforts, ensuring Illumina's scientists and engineers continue the culture of innovation and product excellence that has been a hallmark of Illumina.

Ms. Tousi has more than 25 years of R&D and business leadership at Fortune 100 technology companies and within the life sciences industry. Formerly, Ms. Tousi was as a Corporate Vice President and General Manager for Eastman Kodak's Consumer Inkjet Systems organization. Prior to joining Kodak, she was an R&D program manager for Phogenix Imaging LLC, a joint venture start-up of Hewlett-Packard and Kodak. She previously spent 10 years with Hewlett-Packard in technical and management roles. Ms. Tousi played a significant role in the 2017 launch of the NovaSeq Series at Illumina and in 2018 was elected to the National Academy of Engineers for this effort to make genomics accessible and increasing throughput and enabling the path to the \$100 human genome.

Ms. Tousi serves as a trustee at the world renowned La Jolla Playhouse.



**Mark Van Oene**

SVP, Chief Commercial Officer

Mark Van Oene is Senior Vice President and Chief Commercial Officer for Illumina, a position he has held since 2017. He is responsible for the development and implementation of the company's commercial strategy and is responsible for world-wide sales, services and marketing.

Mr. Van Oene was previously Illumina's Senior Vice President of the Americas region and subsequently named interim Chief Commercial Officer in late 2016. He joined Illumina in 2006 as Regional Account Manager for Canada. In 2008, he assumed the role of Senior Director of Sales for the Americas and was promoted to Vice President with responsibility for global sales in 2012. In early 2014, Mr. Van Oene was named the General Manager for the Americas region, advancing to Senior Vice President in April 2016.

Prior to Illumina, Mr. Van Oene was Director, Genotyping Services for Ellipsis Biotherapeutics.

Note: Please refer to Illumina's company website for the complete list of the management team.



# BOARD OF DIRECTORS

## Jay Flatley

Chairman

Mr. Flatley led Illumina as CEO from 1999 until 2016 and now serves as Chairman of the Board of Directors. He oversaw the company's expansion from microarrays into next-generation sequencing with the acquisition of Solexa in 2006, and from research into clinical and applied markets. Under his leadership, Illumina was named multiple times to the Deloitte & Touche Fast 50 and Fast 500 lists, as well as to the Forbes 25 Fastest-Growing Tech Companies (2007, 2009 and 2010), the Fortune 100 Fastest-Growing Companies (2010 and 2011) lists, and recognition by MIT Technology Review as the World's Smartest Company in 2014.

Mr. Flatley chairs the Board of Directors for Illumina. In addition to his work at Illumina, he serves on the Boards of Directors at Coherent, Denali, Iridia and on the Board of Trustees for The Salk Institute and is an Advisory Board member for UC San Diego's Moores Cancer Center.

## Francis deSouza

Refer to biography on page 30.

## Frances Arnold, PhD

Dr. Arnold has been a director since 2016. She is the recipient of numerous honors, including most recently the 2018 Nobel Prize for Chemistry. Dr. Arnold manages a research group at the California Institute of Technology and is the Dick and Barbara Dickinson Professor of Chemical Engineering, Bioengineering and Biochemistry at the California Institute of Technology and Director of the Donna and Benjamin M. Rosen Bioengineering Center. Dr. Arnold's laboratory focuses on protein engineering by directed evolution, with applications in alternative energy, chemicals, and medicine. Dr. Arnold serves as a director Alphabet Inc. and Provivi, Inc., a privately-held biopesticide company.

## Caroline Dorsa

Ms. Dorsa has been a director since January 2017. Ms. Dorsa served as EVP and CFO of Public Service Enterprise Group Incorporated, a NYSE-listed diversified energy company, from April 2009 until her retirement in October 2015, and served on its Board of Directors from 2003 to April 2009. She has served as SVP, Global Human Health, Strategy and Integration at Merck, SVP and CFO of Gilead Sciences, and SVP and CFO of Avaya. From 1987 to January 2007, Ms. Dorsa held several leadership positions at Merck & Co., Inc., including VP and Treasurer, Executive Director of U.S. Customer Marketing, and Executive Director of U.S. Pricing and Strategic Planning. Ms. Dorsa also serves on the Board of Directors of Biogen and Intellia Therapeutics, and is on the Board of Trustees of the Goldman Sachs ETF Trust, the Goldman Sachs MLP and Energy Renaissance Fund and the Goldman Sachs MLP Income Opportunities Fund.

## Scott Gottlieb, MD

Dr. Gottlieb has been a director since February 2020. Dr. Gottlieb is a physician and served as the 23rd Commissioner of the U.S. Food and Drug Administration from 2017 to 2019. His work focuses on advancing public health through developing and implementing innovative approaches to improving medical outcomes, reshaping healthcare delivery, and expanding consumer choice and safety. He is currently a partner at the venture capital firm New Enterprise Associates and a Resident Fellow at the American Enterprise Institute.

Prior to serving as Commissioner, Dr. Gottlieb held several roles in the public and private sectors, serving as a venture partner at New Enterprise Associates from 2007 to 2017. Dr. Gottlieb was previously the FDA's Deputy Commissioner for Medical and Scientific Affairs from 2005 to 2007, as well as a senior advisor to the FDA Commissioner from 2003 to 2004. He was also a senior advisor to the Administrator of the Centers for Medicare and Medicaid Services in 2004.

## Robert S. Epstein, MD

Dr. Epstein has been a director since November 2012. Dr. Epstein is an epidemiologist who worked in public health and academia before joining the private sector. From 2010 to 2012, Dr. Epstein was Chief R&D Officer and President of Medco-UBC, a 2,400 person global research organization focused on conducting personalized medicine, health economics, drug safety, outcomes, and comparative effectiveness research on behalf of the biopharmaceutical, medical device, and diagnostics industries. Prior to this role, Dr. Epstein was Medco's Chief Medical Officer for 13 years, where he led formulary development, clinical guideline development, drug information services, personalized medicine program development, and client analytics and reporting. Dr. Epstein serves on the Board of Directors of Fate Therapeutics, Inc. and Veracyte, Inc. and privately-held companies Intellos LLC and Proteus Digital Health. Dr. Epstein has published more than 75 peer-reviewed medical articles and book chapters and serves as a reviewer for several influential medical journals, including the NEJM and JAMA.

## Gary S. Guthart, PhD

Gary S. Guthart, Ph.D. has been director since December 2017. Dr. Guthart is currently President and Chief Executive Officer of Intuitive Surgical, a global leader in the field of robotic-assisted minimally invasive surgery. He joined Intuitive Surgical in April 1996 and has served as the Chief Executive Officer since January 2010. In July 2007, he was promoted to President, having assumed the role of Chief Operating Officer in February 2006. Prior to joining Intuitive Surgical, Dr. Guthart was part of the core team developing foundation technology for computer enhanced-surgery at SRI International (formerly Stanford Research Institute). Dr. Guthart served as a member of the Board of Directors of Affymetrix, Inc. from May 2009 until its acquisition by Thermo Fisher Scientific Inc. in March 2016.

# BOARD OF DIRECTORS

## Philip Schiller

Mr. Schiller has been a director since July 2016. Mr. Schiller rejoined Apple Inc. in April 1997 and assumed his current position as Senior Vice President, Worldwide Marketing in February 2002 and is a member of Apple's executive team responsible for the company's product marketing, developer relations, business marketing, education marketing, international marketing, and App Store programs. He has helped Apple create and market some of the best-selling products in the world including the Mac, iPod, iTunes, iPhone, the App Store, Apple TV, and the Apple Watch. Prior to rejoining Apple, Mr. Schiller was Vice President of Product Marketing at Macromedia, Inc. from 1995 to 1997 and Director of Product Marketing at FirePower Systems, Inc. from 1993 to 1995. Prior to that, Mr. Schiller spent six years at Apple in various marketing positions.

## Sue Siegel

Ms. Siegel most recently served as GE's Chief Innovation Officer and CEO of GE Ventures where she oversaw investment in startups, created and scaled new companies, and commercialized GE's intellectual property. She joined GE in 2012 as CEO of healthymagination and built GE Ventures. Prior to joining GE, Ms. Siegel led investments at MDV, a Silicon Valley-based venture capital firm. She also previously served as President and Board Member of Affymetrix (acquired by TMO).

Current board directorships include Align Technology and MIT's The Engine. She serves on advisory boards including: University of California's Innovation Council, Harvard Partners' Healthcare Innovation, RAND Health Care, B&W's Hospital Scientific Advisory Board, Stanford Medicine Board of Fellows, and USC Marshall School of Business Board of Leaders. She is a Henry Crown Fellow of the Aspen Institute and is a member of Women Corporate Directors and of YPO-Gold.

## John W. Thompson

John W. Thompson has been a director since 2017. He brings executive leadership experience having served as chief executive officer roles at Virtual Instruments and Symantec as well as 28 years of prior leadership experience at IBM where he held senior roles in sales, marketing, software development and as general manager of IBM Americas. He is chairman of the board at Microsoft and has served on the corporate boards of Symantec, NIPSCO (Northern Indiana Public Service Company), Fortune Brands, Seagate Technologies, and United Parcel Service (UPS). Mr. Thompson is a member of the board of trustees for the Wetlands America Trust and formerly a member of the national board of Teach for America. In addition, he has served on several government commissions including the Financial Crisis Inquiry Commission, the National Infrastructure Advisory Council, and the Silicon Valley Blue Ribbon Task Force on Aviation Security and Technology.

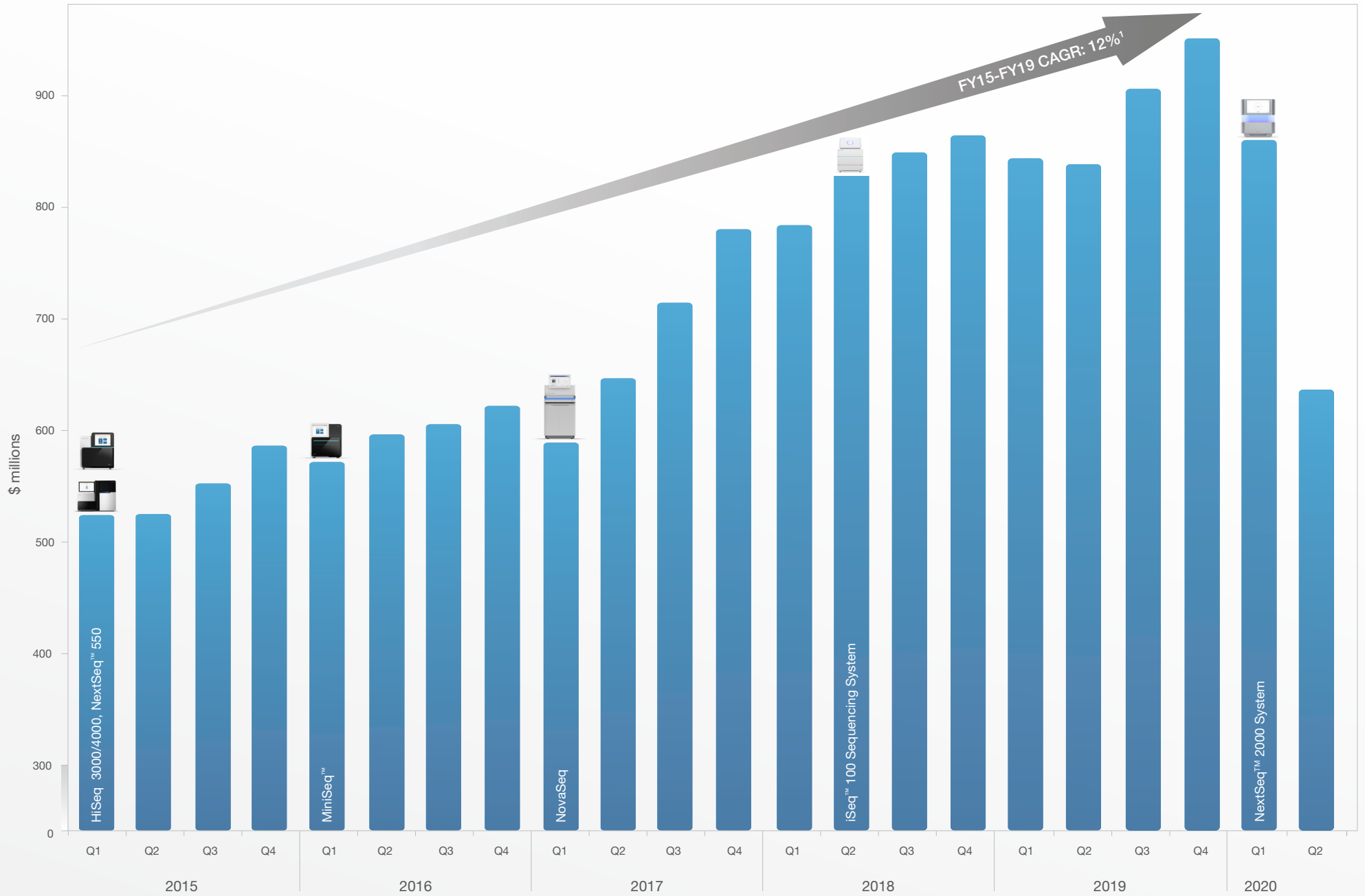
## Committee Composition

	Audit	Compensation	Nominating and Corporate Governance	Science and Technology	Financial Expert	Class*
Jay Flatley				■		2021
John W. Thompson	■				■	2021
Francis deSouza						2022
Frances Arnold, PhD			■	■		2022
Caroline Dorsa	■	■			■	2020
Robert S. Epstein, MD		■	■			2020
Scott Gottlieb, MD						2020
Gary S. Guthart, PhD		■		■		2021
Philip Schiller			■	■		2020
Sue Siegel	■				■	2022

\*Listed class refers to the year of term expiration. As of 2019, our Amended and Restated Certificate of Incorporation, and bylaws provide for the complete declassification of our Board of Directors by 2022.

■ Chair ■ Member

# REVENUE GROWTH



Note: Select system launches indicated above. Quarterly financial information is unaudited.  
<sup>1</sup>Historic CAGR is not intended as an indicator of future expectations.

## Statement regarding use of non-GAAP financial measures

The company reports non-GAAP results for diluted net income per share, net income, gross margins, operating expenses, operating margins, other income, and free cash flow in addition to, and not as a substitute for, or superior to, financial measures calculated in accordance with GAAP. The company's financial measures under GAAP include substantial charges such as amortization of acquired intangible assets, non-cash interest expense associated with the company's convertible debt instruments that may be settled in cash, and others that are listed in the itemized reconciliations between GAAP and non-GAAP financial measures included in this presentation. Management has excluded the effects of these items in non-GAAP measures to assist investors in analyzing and assessing past and future operating performance. Additionally, non-GAAP net income attributable to Illumina stockholders and diluted earnings per share attributable to Illumina stockholders are key components of the financial metrics utilized by the company's board of directors to measure, in part, management's performance and determine significant elements of management's compensation.

The company encourages investors to carefully consider its results under GAAP, as well as its supplemental non-GAAP information and the reconciliation between these presentations, to more fully understand its business. Reconciliations between GAAP and non-GAAP results are presented in the tables of this presentation.

## Use of forward-looking statements

This presentation may contain forward-looking statements that involve risks and uncertainties. Among the important factors to which our business is subject that could cause actual results to differ materially from those in any forward-looking statements are: (i) the impact to our business and operating results of the COVID-19 pandemic; (ii) changes in the rate of growth in the markets we serve; (iii) the volume, timing and mix of customer orders among our products and services; (iv) our ability to adjust our operating expenses to align with our revenue expectations; (v) our ability to manufacture robust instrumentation and consumables; (vi) the success of products and services competitive with our own; (vii) challenges inherent in developing, manufacturing, and launching new products and services, including expanding or modifying manufacturing operations and reliance on third-party suppliers for critical components; (viii) the impact of recently launched or pre-announced products and services on existing products and services; (ix) our ability to further develop and commercialize our instruments and consumables, to deploy new products, services, and applications, and to expand the markets for our technology platforms; (x) our ability to obtain regulatory clearance for our products from government agencies; (xi) our ability to successfully partner with other companies and organizations to develop new products, expand markets, and grow our business; (xii) our ability to successfully identify and integrate acquired technologies, products, or businesses; and (xiii) the application of generally accepted accounting principles, which are highly complex and involve many subjective assumptions, estimates, and judgments, together with other factors detailed in our filings with the Securities and Exchange Commission, including our most recent filings on Forms 10-K and 10-Q, or in information disclosed in public conference calls, the date and time of which are released beforehand. We undertake no obligation, and do not intend, to update these forward-looking statements, to review or confirm analysts' expectations, or to provide interim reports or updates on the progress of the current quarter.