



MCEVOY & FARMER
DIAGNOSTIC INDUSTRY SPECIALISTS SINCE 1986

Who's Who
and
What's Where
in
Global NGS Markets

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9th Edition

April 2020

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Lab Profiles

• Please see accompanying excel document for master lab spreadsheet, covering the top 200 US labs

Please understand we can't give everything away; the xxx figures below represent the actual numbers in the report.

EXECUTIVE SUMMARY

HOW MUCH MONEY? HOW MANY INSTRUMENTS?

How much money?

NGS labs in the US took in **\$6.1-6.4b** for their services in 2019, and spent **\$3.0-3.1b** with their suppliers. The NGS ecosystem grew 11-12% during last year. In April of 2020 we remember those days fondly, along with the several years prior, because growth in 2020 will be hard to produce. Illumina was expecting 9-11% growth in 2020, which means growth for the industry might have been expected to be in that range as well. The global viral crisis will extinguish whatever growth most manufacturers were hoping for in 2020. We're just hoping the numbers above will not be too much smaller in next year's 10th edition of this document. At least two months of average activity will not happen this year, but perhaps pent up demand will bring back half of the business lost by the lab shutdown. We expect the market to contract by at least 10-15% this year

<u>How many active sequencers?</u>	<u>Global</u>	<u>US</u>
<u>Big sequencers</u> • Sold for \$500,000+ • NovaSeq/HiSeq/RSII	2,600-2,800	1,300-1,400
<u>Mid-range sequencers</u> • Sold for \$125,000-500,000 • NextSeq/Sequel/PromethIon/S5XL	x,xxx-x,xxx	x,xxx-x,xxx
<u>Affordable conventional sequencers</u> • Sold for \$19,000-99,000 • MiSeq/MiniSeq/iSeq/PGM/S5/GridIon	xx,xxx-xx,xxx	x,xxx-x,xxx
<u>Backpack sequencers</u> • MinIon units sold for less than \$1,000	x,xxx-x,xxx	x,xxx-x,xxx

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EXECUTIVE SUMMARY

HOW MANY INSTRUMENTS? HOW MANY LABS?

In addition to the conventional sequencers cited above, another 1,600-1,700 10X Chromium systems have been placed worldwide, of which 900-1,000 are working in the US. These sold for \$70,000-80,000.

How many labs?

<u>The top tier</u>	<u>Global</u>	<u>US</u>
<ul style="list-style-type: none"> • 10+ NovaSeqs and/or HiSeqX 10 • Also other HiSeq, PacBio, 10X, desktops 	40-50	15-20
<u>The second tier</u>		
<ul style="list-style-type: none"> • Average of 3-4 NovaSeqs • Also PacBio, 10X, and/or desktops 	xxx-xxx	xx-xx
<u>The third tier</u>	xxx-xxx	xxx-xxx
<ul style="list-style-type: none"> • Just one NovaSeq • Also one or more desktops and/or 10X 		
<u>The fourth tier</u>	x,xxx-x,xxx	x,xxx-x,xxx
<ul style="list-style-type: none"> • NextSeq/Proton/S5XL/PromethIon is primary workhorse 		
<u>The fifth tier</u>		
<ul style="list-style-type: none"> • MiSeq/MiniSeq/iSeq/PGM/S5/GridIon is primary workhorse 	x,xxx-xx,xxx	x,xxx-x,xxx
<u>The sixth tier</u>		
<ul style="list-style-type: none"> • MinIon units in backpacks 	x,xxx-x,xxx	x,xxx-x,xxx

Please understand we can't give everything away; the actual numbers for each instrument are in the report.

EXECUTIVE SUMMARY

GLOBAL ACTIVE INSTALLED BASE ESTIMATES - APRIL 2020

	First Year Sold	Global Active Total	Global 2019 Units Sold	US Active Total	US 2019 Units Sold	Sales Price Range
Illumina						
• NovaSeq	2017	960-1,000	350-400	450-500	225-250	\$900-990k
• HiSeq X	2014	340-360	none	120-130	none	\$900-990k
• Other HiSeq	2010					
• NextSeq	2014					
• MiSeq	2011					
• MiniSeq	2016					
• iSeq	2018					
Thermo						
• PGM	2010					
• Proton	2013					
• S5	2015					
• S5XL	2015					
Oxford						
• MinIon	2014					
• GridIon	2017					
• PromethIon	2017					
PacBio						
• RSII	2012					
• Sequel	2015					
• Sequel II	2019					

Please understand we can't give everything away; the actual numbers for each lab are in the report.

EXECUTIVE SUMMARY

STATE OF THE ARMS RACE – 14 US LABS OPERATE A \$10M+ ARSENAL OF SEQUENCERS

Lab	Based in	\$ value of sequencers	Short Read	Short Read *	Long Read **	
			Million \$ systems	Other Hi Thruput	10X	PacBio
			NovaSeqs & HiSeq X	HiSeq 3000/4000 HiSeq 2000/2500		
1. Broad	Boston, MA	\$42-45m	35-40	4-6	1+	2+
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10						
11						
12						
13						
14. Personalis	E. Palo Alto, CA	\$10-11m	10-11			

* Each lab above also has several NextSeqs and MiSeqs backing up their big sequencers. Decommissioned HiSeq 2000 and HiSeq 2500s have been removed from the list. For these labs they are emergency backups.

** Each lab has at least a few Oxford MinIon units for experimentation, but the only GridIon/PromethIon service providers are at Cold Spring Harbor and U. of Wisconsin

Please understand we can't give everything away; the actual numbers for each manufacturer are in the report.

EXECUTIVE SUMMARY

WHERE SEQUENCING LABS SPEND MONEY – 93% OF SPENDING GOES TO JUST 20 MANUFACTURERS

Manufacturer	Global NGS Revenues	US NGS Mkt. Share	All US NGS Revenues	Instruments US Revenues	Consumables US Revenues	Services/other US Revenues
1. Illumina	\$3,100	58.1%	\$1,770	\$270	\$1,190	\$310
2. Thermo						
3. Agilent						
4. 10X						
5. Qiagen						
6. Beckman						
7. IDT						
8. Roche						
9. Bio-Rad						
10. PacBio						
11. Oxford						
12. Perkin Elmer						
13. Tecan						
14. NEB						
15. Twist						
16. Fluidigm						
17. Hamilton						
18. WuXi						
19. BioNano						
20. Golden Helix						
Others	\$490	7.4%	\$225	\$50	\$120	\$55
Totals	\$5,998	100%	\$3,066	\$536 (17%)	\$2,008 (66%)	\$520 (17%)

The report has pages like this on the top 20 manufacturers of NGS products.

MANUFACTURER PROFILE
10X GENOMICS

Company	10X Genomics www.10Xgenomics.com
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Importance	#4 supplier of American NGS labs with 4.2% of market #1 single-cell genomics company
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Who's Who		<u>Since</u>
	Dr. Serge Saxena – Chief Executive Officer, Co-Founder	11/12
	Dr. Ben Hindson – Chief Scientific Officer, Co-Founder	11/12
	Mr. Brad Crutchfield – Chief Commercial Officer	2/17
	Mr. Michael Schnall-Levin - SVP, R&D	1/13
	Mr. Alexander Wong - VP, Software and Infrastructure	12/13
	Dr. Sam Ropp – SVP, Global Sales	1/17
	Mr. Paul Wyatt – VP, Operations	6/13
	Ms. Lisa Sellers - VP Marketing	4/18
	Dr. Jonathan Schimmel - VP, Global Support/Sales Ops	3/16
	Mr. Edwin Hauw – VP, Strategic Marketing	5/17
	Dr. Chris Hindson - Sr. Director, Product/Chemistry/Reagents	11/12
	Mr. Mike Lucero – VP, Product Strategy	11/15

2019 Big Picture Revenues

All of 10X Genomics - Global	\$246m	57% North America	14% instruments
NGS – Global	\$246m	22% Asia/Pacific	84% consumables
NGS – US	\$135m	21% Europe	2% services

2019 US Segment Revenues

- Sequencing consumables: \$158,000/instrument/year
 - Instrumentation: \$70,000-75,000/unit
 - Instrument service and support
-

Platforms

Chromium

Revenues

\$110-115m

\$15-20m

\$2-3m

US NGS Total
\$130-135m

The report has pages like this on the top 20 manufacturers of NGS products.

MANUFACTURER PROFILE	10X GENOMICS				
Stock performance	9-13-19:	\$39.00	IPO price		
• TXG	9-13-19:	\$52.75	price at the end of the IPO day		
	1-1-20:	\$91.39	Up 123% during 3.5 months of 2019		
	4-9-20:	\$65.92	Down 28% since beginning of the year		
Recent publicly reported results (\$m)		<u>US</u>	<u>Ex-US</u>	<u>Total</u>	<u>Growth-Global</u>
• Full year 2019		est.	est.	reported	reported
	• Consumables	113	94	207	
	• Instruments	19	16	35	645 new units
	• Services	3	1	4	
		135	111	246	+68%
Other recent financial reporting	Market Capitalization	\$5.88b	Price Sales	9.67	
• April 9, 2020	Enterprise value	\$5.48b	Debt Equity	7.07	
	Last 12 months revenues	\$246m	Cash	\$424m	
	EBITDA	\$7.2m	Debt	\$29.72m	
Otherwise notable	<p>10X Genomics was #7 in 2017 with revenues of \$71m. Their revenues roughly doubled in both 2017 and 2018; during 2019 growth slowed to a still enviable 68%. 10X Genomics is now the #4 manufacturer in NGS markets, with 2019 revenues of \$245m. Trends suggest they could pass Agilent and become the #3 supplier of NGS labs within a year or two. This company has had the most extraordinary sales growth in the NGS business over the last four years, while making a few powerful enemies in their spare time. They reached a settlement with BD in October, but their patent dispute with Bio-Rad continues to subsidize the extravagant lifestyles of a room full of overpaid Bay Area lawyers. Also in October 10X raised \$590m in their IPO, so they can afford it. At the end of 2019 there were more than 1,666 <i>Chromium</i> and <i>Gemcode</i> single-cell genomics systems working at 1,000-1,000 labs worldwide, having added 645 units to their global installed base during the year, of which 320-330 were placed at US labs.</p>				

EXECUTIVE SUMMARY

WHAT HAPPENED IN 2019 • WHAT TO EXPECT IN 2020 AND BEYOND

Below we offer a concise summary of the most important developments of the last 15 months with the top twenty NGS product suppliers, who deliver 93% what NGS labs buy. **These are meant to be quick descriptions; the further details on market share and revenue by segment and by platform are in the profiles that follow after this executive summary.**

We see the top twenty companies described below as falling into five categories:

The big, rich, establishment seven – Illumina, Thermo, Agilent, Qiagen, Roche, Bio-Rad, and PerkinElmer. Illumina controls 58% of the market; the other six supply 20%. Each of the big seven have offerings for multiple NGS workflow market segments. These seven have built their NGS portfolios through acquisitions, and all but Qiagen can be expected to continue acquiring.

The three long-read specialists – PacBio, 10X Genomics, and Oxford Nanopore – an incumbent in decline and two upstarts on steep ascents

The three library specialists – IDT, NEB, and Fluidigm, for whom NGS markets are a minor but still material franchise

The two liquid handling specialists – Beckman and Tecan

The five barbarians at the gates – Twist, Bionano, BGI, Genapsys, UST. Only Twist had significant revenues in the US during 2019. Bionano's revenues were modest and shrinking. The other three are just ramping up their US launches this year.

EXECUTIVE SUMMARY

WHAT HAPPENED IN 2019 • WHAT TO EXPECT IN 2020 AND BEYOND

The big, rich establishment seven

Illumina is the apex predator and creator of the ecosystem, still controlling 58% of the market. Important events since last year's report would include a merciless spring/summer reign of legal terror cast upon BGI in Germany, Switzerland, and Turkey, as well as the US. In June the Illumina lawyers also bested the Ariosa lawyers; afterwards their enhanced Veriseq was announced, so June was a good month for their NIPT franchise. In January Illumina announced the NovaSeq 1000 and 2000 will ship in the 4th quarter, with list prices of \$210,000 and \$330,000. But Illumina's instrumentation sales were down 3% during 2019, indicating a global glut of sequencing capacity. So the two new mini-NovaSeqs will be generously (or desperately) discounted. Also in January, Illumina conceded that Oxford had succeeded in their efforts to derail the PacBio acquisition. Oxford had lobbied the UK anti-trust authorities successfully, which turned out to be the thin end of the wedge that led other jurisdictions to wake up as well. Oxford and 10X were thusly spared the campaign of predatory pricing that we anticipated they would be enduring this year.

Thermo is #2 in NGS markets in the US. There are 800-850 labs worldwide using the *OncoMine* panels, roughly half in the US. But the US instruments deliver more than two-thirds of global *OncoMine* revenue. In September Illumina threw enough stock and cash at the President of Thermo Sequencing that he actually defected to the enemy. In October Thermo launched their new 500-gene *OncoMine Comprehensive Assay Plus*, a new enhanced alternative to their standard 23-gene *OncoMine* panel. Then in November, Thermo launched their new refrigerator-sized *Genexus* sequencing system, which will be RUO for a while but is meant to eventually bring sequencing dollars to community hospitals.

