

Single Cell Genomics

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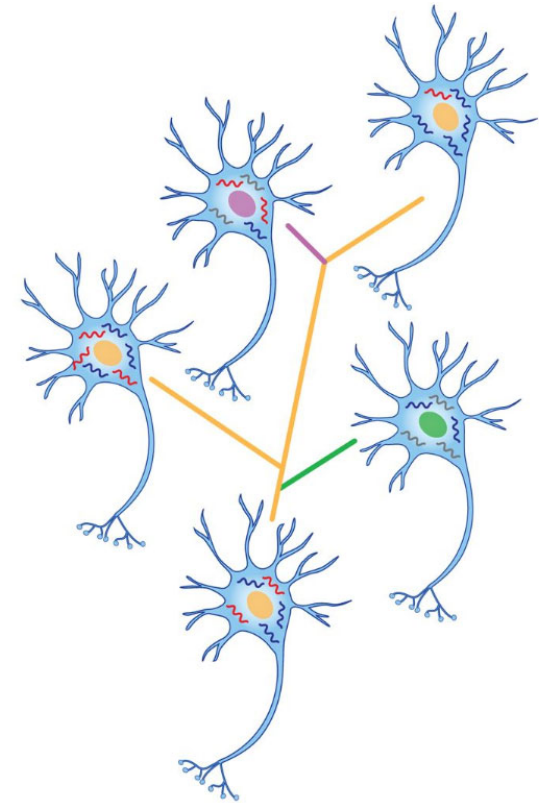
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What is Single Cell Genomics and why do we care?

Traditional Single Cell analysis is a BIG BUSINESS

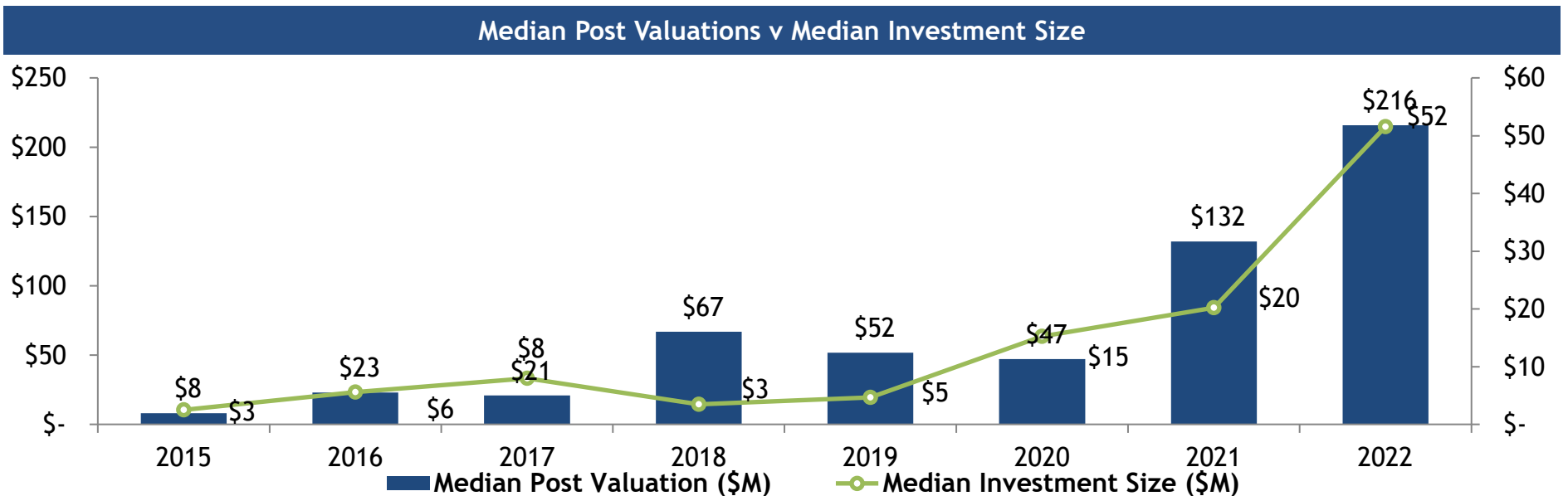
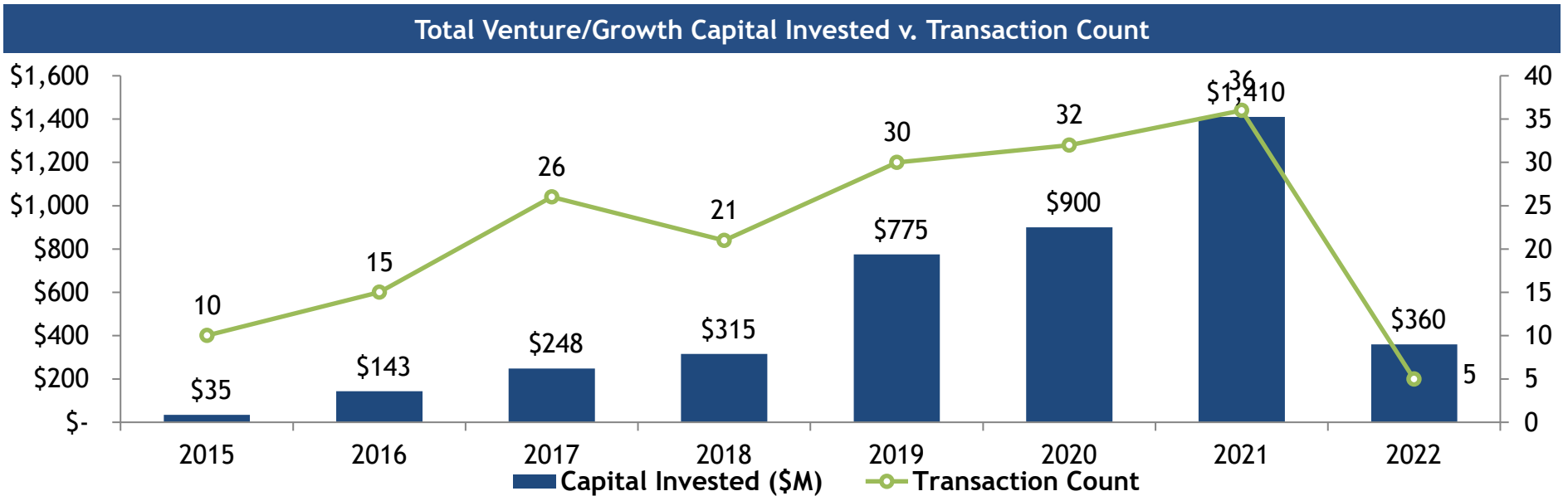
What are the problems with conventional methods and what do new technologies solve?



Single cells may look the same but are expressing different genes and have different behavior relevant to disease

It's attracting staggering amounts of venture funding...

Financing for single cell companies remains strong; More money is going into single cell in larger investment sizes and at higher valuations than ever before



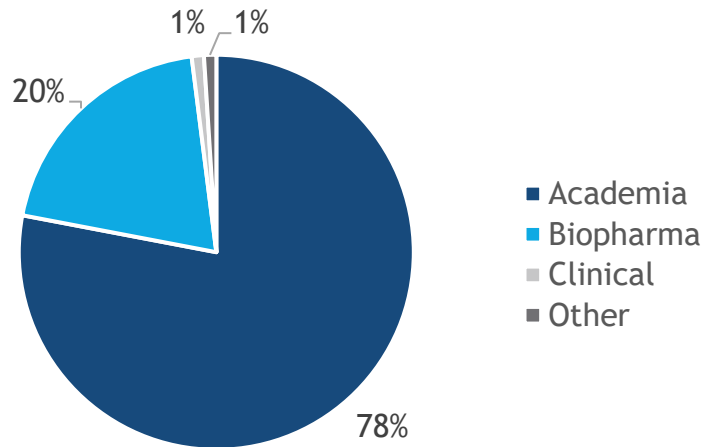
Note: Financing data sourced from Pitchbook, which is not representative of the entire single cell fundraising universe.

Reflects angel, seed, venture, growth, IPO proceeds, and PIPE financings

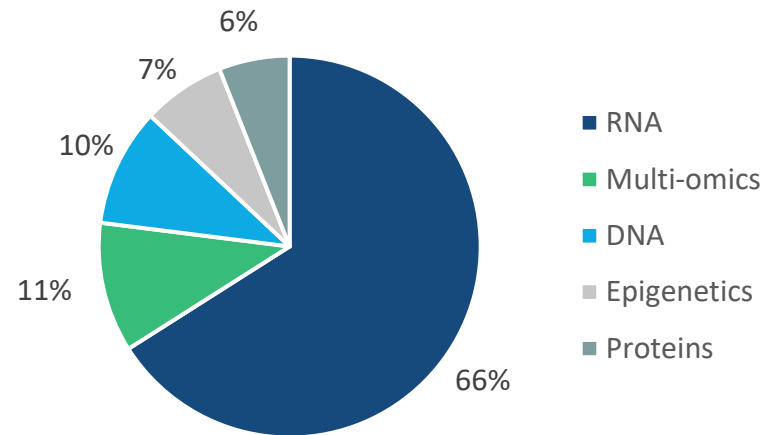
What is the market structured like today?

The SCG market is estimated to be \$1B with growth projections between 20-30%. Historically, growth of the SCG market was tied to Fluidigm's success; it is now tied to 10x's.

By Customer Type

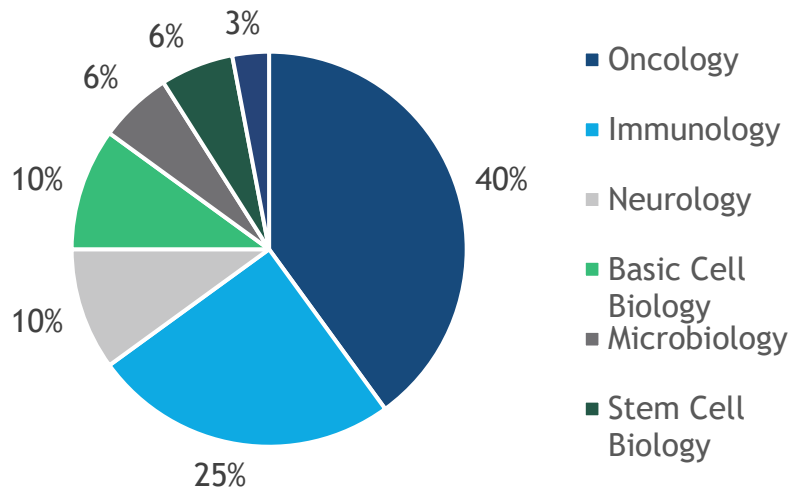


By Analyte



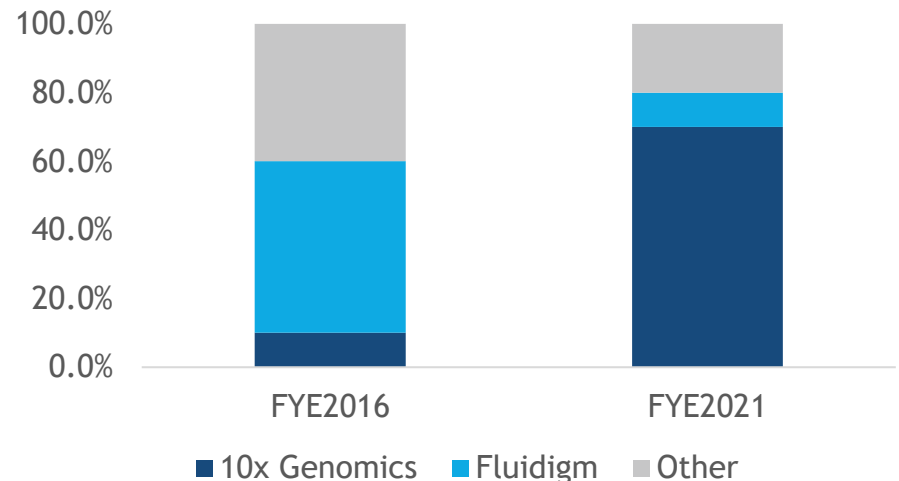
Multiomics approaches are most commonly looking at analyzing protein and RNA; other analyte combinations are emerging

By Field of Study

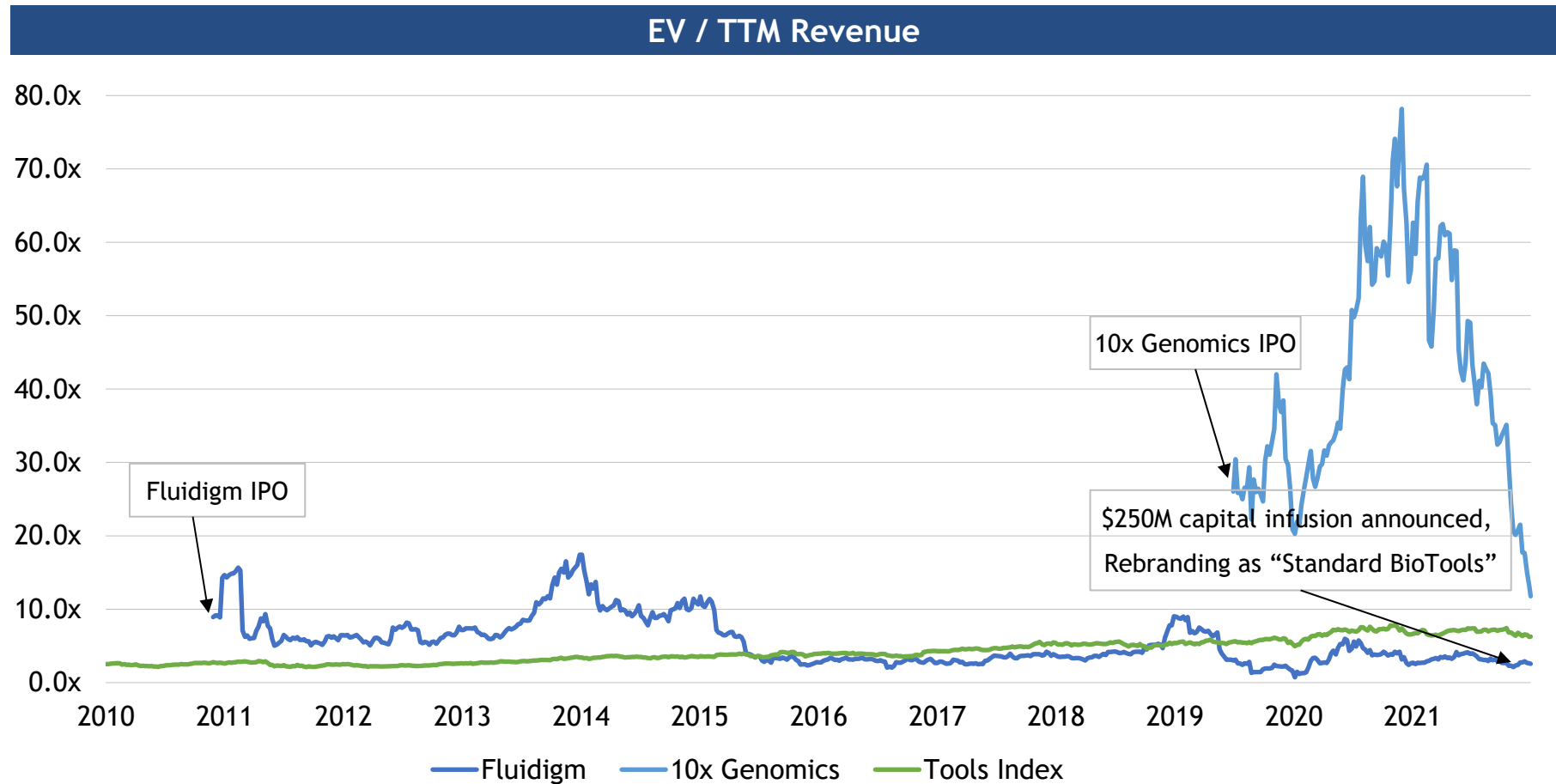


Oncology and immunology are expected to grow fastest driven by advancements in single-cell multiomic techniques (i.e. CITE-seq, REAP-seq).

Sample Prep Market Share



The 'original' Market Bottleneck was Cellular Throughput



- Fluidigm was the single cell genomics 'market creator', but its tool was capped in cellular throughput (700-1,000 cells max)
- 10x solved for this bottleneck (enabling throughput of 10,000's of cells) and has since taken the market
- Demand is still high for additional throughput (upwards of 1M cells)

Source: CapIQ through 3/15/22

Tools Index: A, BDX, BRKR, DHR, ILMN, LMNX, PKI, QGEN, TMO, VIVO, WAT, TECH, BIO

Single-Cell Collection and Analysis Platforms - High Throughput



Instrument	ICELL8	Chromium	ddSEQ	InDrop	Rhapsody	Tapestri	Nadia	Genesis
Company								
Launch Date	2015	2016	2017	2017	2017	2017	2017	2018
Technique	Nanowell Chip	Droplet	Droplet	Droplet	Microwells (200K)	Droplet	Droplet	Microwells (100K, 250K)
Throughput	1,000s	10,000s+	10,000s	10,000s+	10,000s+	10,000	10,000s+	10,000s+
Instrument Price	\$150-\$200K	\$75,000	\$60,000	\$50,000	\$70,000	\$79,500	\$65,000	\$69,995
Price / Cell	\$1-2	\$0.13-\$1.25	\$1	\$0.05	\$0.30	\$0.16	\$0.07	\$0.05-\$0.07
Applications	RNA-seq, TCR Profiling	RNA-seq, ATAC-seq, Immune Repertoire Profiling	RNA-Seq, ATAC-Seq	RNA-Seq	Targeted RNA-Seq, Proteomics (RNA + Protein)	Targeted DNA-Seq, Proteomics (DNA + Protein)	RNA-Seq, DroNc-Seq, Open	RNA-Seq, Multiomics, Open
Imaging?	Yes	No	No	No	Yes	No	No	Yes
Cell Selection?	Yes	No	No	No	No	No	No	No
Starting # of Cells	Low	High	Moderate	High	Moderate	High	High	Moderate
Flexibility? (of Protocol Design)	Yes	No	No	No	Low	Low	Yes	Yes
Technical Skills?	Low	Low	Low	High	Low	Low	High	Moderate

Source: Review Article: Platform for Single-Cell Collection and Analysis (2018); BroadOak Company Interviews; Company Websites