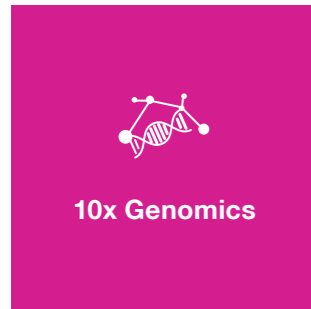


# 10x Genomics

## Gene sequencing

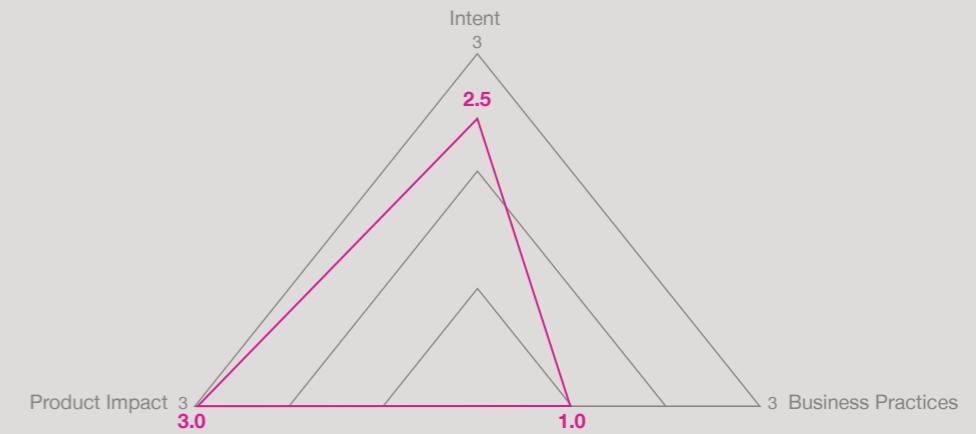


10x Genomics develops instruments and consumables for the analysis of single cells. When combined with next generation sequencing, 10x Genomics' tools enable researchers to measure and interpret differences between individual cells in a sample.

## Investment Case

<b>What challenge is the Company tackling?</b>	Advancing our understanding of biology plays an important role in improving healthcare outcomes. 10x's products provide extra dimensions through which to analyse the expression of genes in cells. While conventional gene sequencing reads the genome of the 'average' cell in a sample, 10x's technology can capture the DNA, RNA, protein and immunological information of each individual cell in the sample and can even spatially map gene expression activity across a tissue sample. This has an enormous impact on how we understand biology and treat diseases.
<b>Is the Company's offering sufficiently different and better than the status quo?</b>	Compared to traditional bulk sequencing, single cell analysis provides a more granular view of biology and advances our understanding of health and disease. The benefit of single cell sequencing is that it can help researchers examine biology with higher resolution; identify new cell types; identify different cells in a tumour to provide information; analysis how stem cells differentiate into different functional cells and in the study of the immune systems. 10x has an early technical lead over competitors.
<b>Is there a committed management team? What have they done before?</b>	The management team are clearly driven by a mission to improve human health and the company's emphasis on culture and customers is reassuring. Founder Serge Saxonov described the mission of 10x is to maximise its impact on biology by coming up with tools that will allow researchers to learn more about biology and its complexity. The company is not wedded to a particular technology but driven by its mission. The board of directors contains some impressive individuals, most notably is the chair, John Stuelpnagel, who was the co-founder of Illumina.
<b>How does the Company treat stakeholders?</b>	Our colleagues have spoken with researchers and customers of 10x. The responses have been very favourable, in particular on the speed of innovation. This chimes well with our conversation with the management, who spoke at length about the importance of working closely with customers. 10x also seems to treat its employees well with measures brought in by Saxonov, such as paid parental leave and equity, leading to a higher rating on Glassdoor than its peers. Even though gender diversity in the company is higher than the industry, 10x shows signs of wanting to improve. Board diversity sits at 25%, compared to the 10% industry average, and is 15% on the executive team.
<b>Is there a potential to create a profitable and defensible business?</b>	The growth opportunity is attractive as more researchers incorporate single cell analysis into their workflow to help them find new discoveries. The research market alone could be a multi-billion-dollar opportunity. Longer term, single cell analysis could be used in the pharmaceutical and clinical markets. We believe that 10x Genomics is well-positioned to take advantage of this growth opportunity due to its technological edge and its faster pace of innovation. Once researchers incorporate 10x Genomics' tools into their workflow, it becomes a fairly sticky business.
<b>Is the business attractively valued?</b>	10x has a market cap of \$8 billion and EV/sales (2019) of 32 times. To double over 5 years would require a market cap of \$16 billion by 2025, possibly a bit more due to options. From an operational perspective, 10x needs to continue grow its installed base and will need to demonstrate that it has attractive financial characteristics. If we assume installed base grows by 25-40% p.a. and consumable pull-through grows by 0-10% p.a., then revenues could reach between \$800 million and \$2.2 billion by 2024. A large proportion of sales comes from consumables, which should provide good margins. It's notable that 10x already has higher gross margin despite its smaller scale. As it scales up, operating leverage should lead to improvements in operating margins. If we assume 2024 revenues at the middle of our above forecast, then double over 5 years require an EV/sales of 11x (Illumina is currently on 15x), which we think is plausible.

## Impact Analysis



### Product Impact

10x is likely to have an enormous impact on how we understand biology and treat diseases. As a tool for scientific research, there are many unknowns regarding what insights will be uncovered and how they can be applied, but the technology itself has the potential to impact across every dimension of human health.

### Intent

10x has a high level of intent which is both closely linked to several key figures in the business and evidenced by the company's commitment to their customers and field of research. Their score could very easily be a 3, but I am hesitant to award a perfect score to a company which has their intentions so closely contained within a few key people, without having met those people or understanding more about the company culture.

### Business Practices

Good treatment of employees, customers and efforts to advance women in STEM are slightly overshadowed by questions over independence on the board and an ongoing legal case.

	Relevant Targets	Relevant Products
<b>2 ZERO HUNGER</b> 	<b>Target 2.4</b> By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production	This is an early-stage and potential impact for 10x Genomics, which we hope will emerge over time. It is the intention of management to expand the application of 10x products into agronomy, microbiology and zoology.
<b>3 GOOD HEALTH AND WELL-BEING</b> 	<b>Target 3.3</b> By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases  <b>Target 3.4</b> By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being	10x Genomics' products help to better analyse the expression of genes in cells. Whilst conventional gene sequencing reads the genome of the 'average' cell in a sample. 10x's technology can capture the DNA, RNA, protein and immunological information of each individual cell in the sample. This technology could touch upon countless areas of human health. The company highlights neurology, oncology and immunology as key areas,
<b>9 INDUSTRY INNOVATION AND INFRASTRUCTURE</b> 	<b>Target 9.5</b> Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries	Through improving cell analysis, 10x is helping to further the field of genomics as it expands from its current focus on the genome and statistical associations, to the study of biology more broadly. In addition, through improving the accuracy and efficiency of research, 10x can help scientists and pharmaceutical companies reduce the cost of research. For instance, by targeting specific genes when sequencing, rather than the full transcriptome, costs of experiments can fall by 50-75%.

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