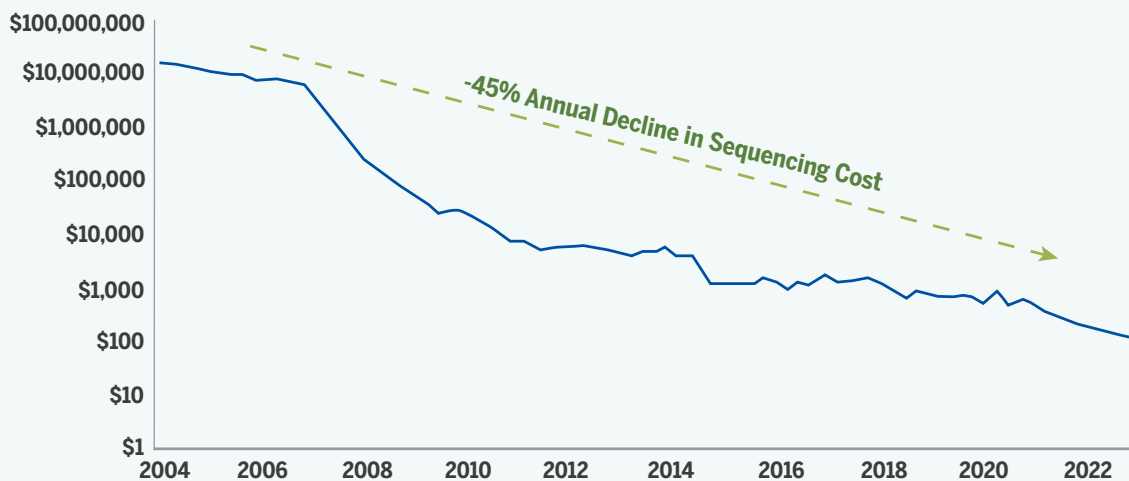


Democratizing DNA

April 2023 marks the 20th anniversary of the completion of the Human Genome Project, which mapped the complete set of genetic instructions, or DNA, of humans. The human genome determines your eye and hair color and has a profound influence on your risk of developing certain diseases. As research within genomics has started to drive major medical breakthroughs, how might investors be positioned to potentially benefit?

Genome Sequencing Becomes Much Cheaper

Cost of Sequencing Human Genome (Log Scale)



Source: National Human Genome Research Institute, Illumina, Complete Genomics. Data as of 12/31/2022.

- All living things have a genetic blueprint (DNA) consisting of chemical building blocks called nucleotides. The order of these blocks determines the biological characteristics of living organisms. In the chart above, the cost to read or sequence the three billion bases of the human genome cost over \$20 million in 2004, fell to \$100,000 in 2009 and with recent new technology iterations is on track to be around \$100-200 in the next year or two.¹ The noticeable drop in sequencing costs after 2009 was the result of innovation in next-generation sequencing technologies, enabling high-throughput and parallel sequencing.²
- Sequencing is not just about DNA but encompasses RNA (ribonucleic acid, the molecule that translates DNA code into proteins), proteomics (the study of proteins), and spatial genomics to understand how gene activity varies across different areas of a tissue. For example, by sequencing the COVID-19 virus's genome, scientists were able to identify its unique characteristics and develop targeted vaccines in a much shorter time frame than traditional methods.
- We believe there are many areas for potential investment opportunities that are tied to genomics. This includes corporations that make DNA sequencing tools and molecular diagnostic products, companies that provide reagents for other consumables, for research and development, DNA testing companies including those in the pre-natal space, select biotech drug development companies, and biologic transportation companies, in our view.



The views expressed are the views of Fred Alger Management, LLC ("FAM") and its affiliates as of April 2023. These views are subject to change at any time and may not represent the views of all portfolio management teams. These views should not be interpreted as a guarantee of the future performance of the markets, any security or any funds managed by FAM. These views are not meant to provide investment advice and should not be considered a recommendation to purchase or sell securities.

Risk Disclosures: Investing in the stock market involves risks, including the potential loss of principal. Growth stocks may be more volatile than other stocks as their prices tend to be higher in relation to their companies' earnings and may be more sensitive to market, political, and economic developments. Local, regional or global events such as environmental or natural disasters, war, terrorism, pandemics, outbreaks of infectious diseases and similar public health threats, recessions, or other events could have a significant impact on investments. **Past performance is not indicative of future performance.** Investors whose reference currency differs from that in which the underlying assets are invested may be subject to exchange rate movements that alter the value of their investments.

Investing in innovation is not without risk and there is no guarantee that investments in research and development will result in a company gaining market share or achieving enhanced revenue. Companies exploring new technologies may face regulatory, political or legal challenges that may adversely impact their competitive positioning and financial prospects. Also, developing technologies to displace older technologies or create new markets may not in fact do so, and there may be sector-specific risks as well. As is the case with any industry, there will be winners and losers that emerge and investors therefore need to conduct a significant amount of due diligence on individual companies to assess these risks and opportunities.

Important Information for US Investors: This material must be accompanied by the most recent fund fact sheet(s) if used in connection with the sale of mutual fund and ETF shares. Fred Alger & Company, LLC serves as distributor of the Alger mutual funds.

Important Information for UK and EU Investors: This material is directed at investment professionals and qualified investors (as defined by MiFID/FCA regulations). It is for information purposes only and has been prepared and is made available for the benefit investors. This material does not constitute an offer or solicitation to any person in any jurisdiction in which it is not authorized or permitted, or to anyone who would be an unlawful recipient, and is only intended for use by original recipients and addressees. The original recipient is solely responsible for any actions in further distributing this material and should be satisfied in doing so that there is no breach of local legislation or regulation.

Certain products may be subject to restrictions with regard to certain persons or in certain countries under national regulations applicable to such persons or countries.

Alger Management, Ltd. (company house number 8634056, domiciled at 78 Brook Street, London W1K 5EF, UK) is authorized and regulated by the Financial Conduct Authority, for the distribution of regulated financial products and services. FAM and/or Weatherbie Capital, LLC, U.S. registered investment advisors, serve as sub-portfolio manager to financial products distributed by Alger Management, Ltd.

Alger Group Holdings, LLC (parent company of FAM and Alger Management, Ltd.), FAM, and Fred Alger & Company, LLC are not authorized persons for the purposes of the Financial Services and Markets Act 2000 of the United Kingdom ("FSMA") and this material has not been approved by an authorized person for the purposes of Section 21(2)(b) of the FSMA.

Important information for Investors in Israel: This material is provided in Israel only to investors of the type listed in the first schedule of the Securities Law, 1968 (the "Securities Law") and the Regulation of Investment Advice, Investment Marketing and Investment Portfolio Management Law, 1995. The Fund units will not be sold to investors who are not of the type listed in the first schedule of the Securities Law.

The -45% annualized decline in sequencing cost took the compounded annualized growth rate over a 19-year period, starting in 2004 at approximately \$20 million through 2022 at approximately \$200.

¹ Illumina company data (September 29, 2022, press release).

² In November 2009, Illumina, a biotechnology company that specializes in DNA sequencing and genotyping, released their HiSeq platform which allowed for the sequencing of more samples in less time, reducing the cost of sequencing per sample and enabling large-scale sequencing projects at a lower cost. Additionally, Illumina's innovative chemistry and sequencing-by-synthesis approach improved sequencing accuracy and efficiency, further contributing to the reduction in sequencing costs.

The National Human Genome Research Institute (NHGRI) is a division of the National Institutes of Health (NIH) in the United States, dedicated to advancing our understanding of human genetics, genomics, and their implications for health and disease through research, education, and policy initiatives.

The following positions represent firm wide assets under management as of December 31, 2022: Illumina, Inc. 0.00%; and BGI-Shenzhen 0.00%.

Alger pays compensation to third party marketers to sell various strategies to prospective investors.