



Why Invest In The Genomic Revolution?

For Informational Purposes Only | As of September 30, 2020

www.ark-funds.com

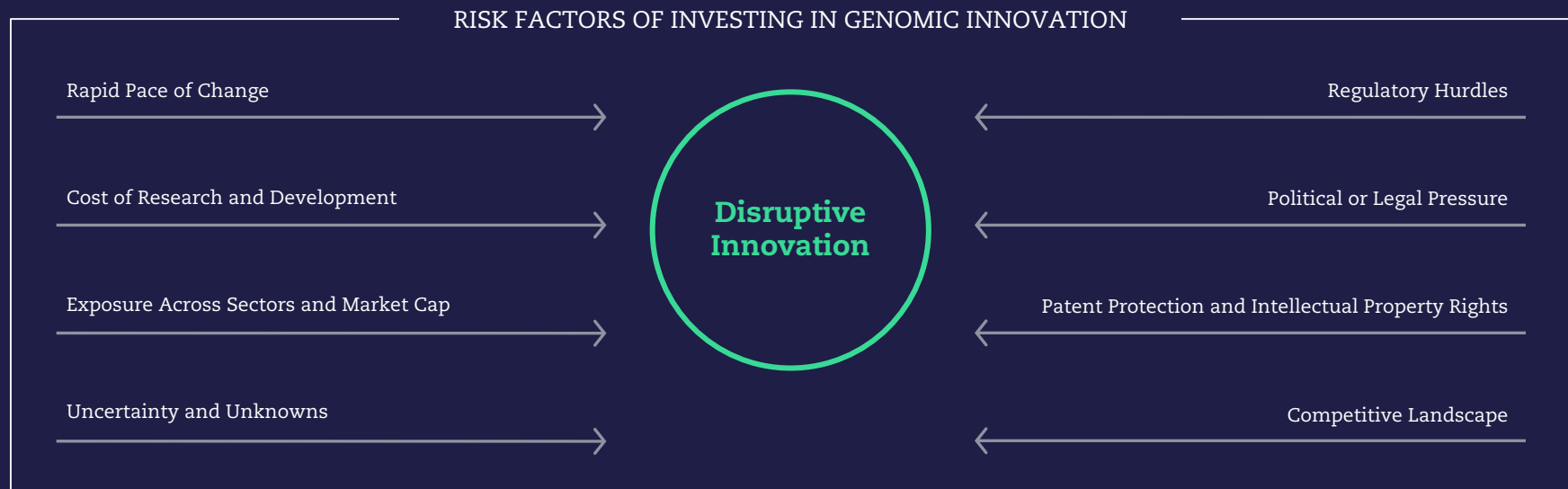
The ARKG logo, consisting of the letters "ARKG" in a large, bold, white sans-serif font, positioned in the bottom right corner of the slide. The background of the bottom right corner features a dark blue diagonal band with a pattern of glowing blue and white horizontal lines, resembling a DNA sequence or data visualization.

ARKG



Risks of Investing in Genomic Innovation

Please note, companies that ARK believes are capitalizing on disruptive innovation and developing technologies to displace older technologies or create new markets may not in fact do so. ARK aims to educate investors and seeks to size the potential investment opportunity of disruptive innovation in the genomic space, noting that risks and uncertainties may impact our projections and research models. Investors should use the content presented for informational purposes only, and be aware of market risk, disruptive innovation risk, regulatory risk, and risks related to certain innovation areas. **Please read risk disclosure carefully.**



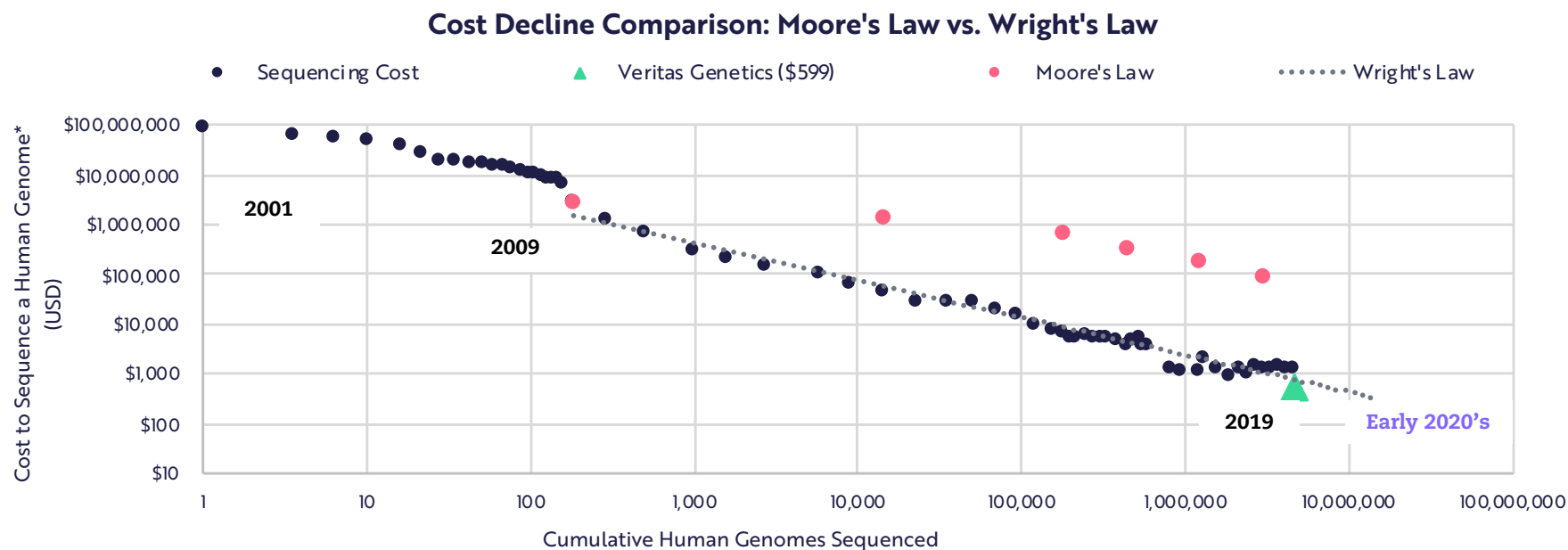
→ Aim for a cross-sector understanding of technology and combine top down and bottom up research.

→ Aim to understand the regulatory, market, sector, and company risks. (See Risk and Disclosure at the end)



The Cost of DNA Sequencing Is Declining Precipitously

ARK believes that NGS costs are declining at a rapid rate, following Wright's Law: for every cumulative doubling in units produced, costs decline 40%. If NGS had followed Moore's Law¹ since 2009, the cost to sequence a whole human genome today would be \$100,000—more than two orders of magnitude higher than the \$1,000 that Wright's Law predicted.



[1] Moore's Law: Gordon Moore's prediction that the number of transistors on a chip would double every two years.

*Human genome data equivalents equate to 96 gigabases of sequence data.

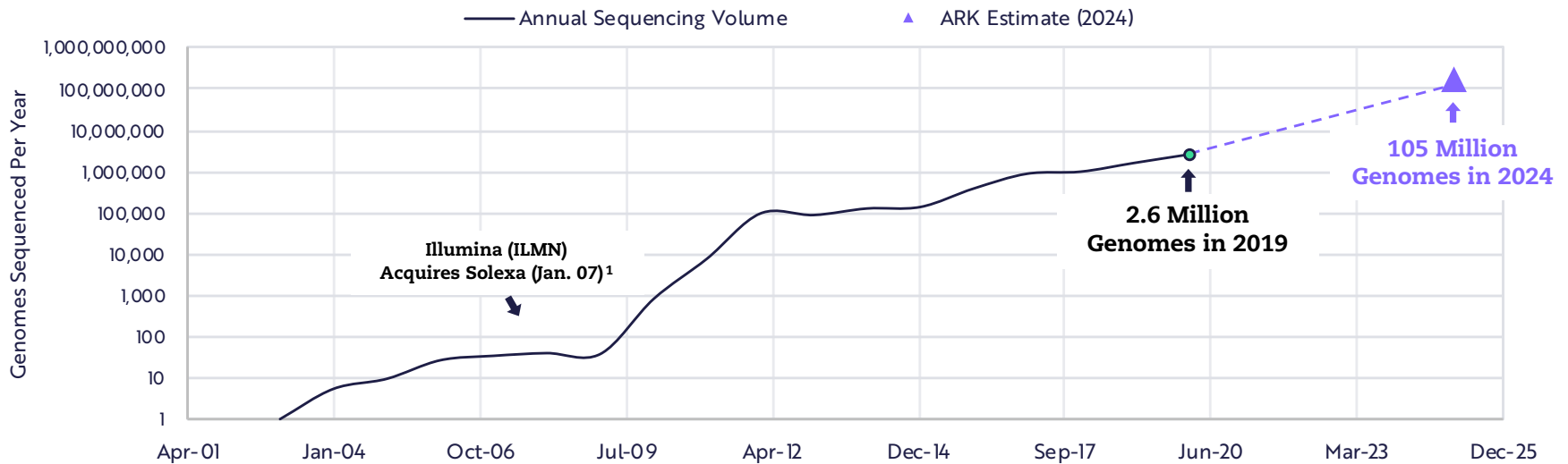
Forecasts are inherently limited and cannot be relied upon. | Source: ARK Investment Management LLC, 2019; "The Cost of Sequencing a Human Genome." Genome.gov, arkinv.st/2SIImZm. This is not a recommendation in relation to any named securities and no warranty or guarantee is provided. Any references to particular securities are for illustrative purposes only.



As Costs Decline, Demand for Sequencing Is Surging

ARK believes that the number of whole human genomes sequenced per year should scale 110% at an annual rate, from roughly 2.6 million in 2019 to 105 million in 2024, thanks to the clinical adoption of molecular diagnostics. Among these sequencing-intensive tests are: liquid biopsies, solid tumor profiling, germline testing, immune-oncology, and non-invasive prenatal screening.

Annual Sequencing Volume Is Accelerating as NGS Enters Clinical Practice



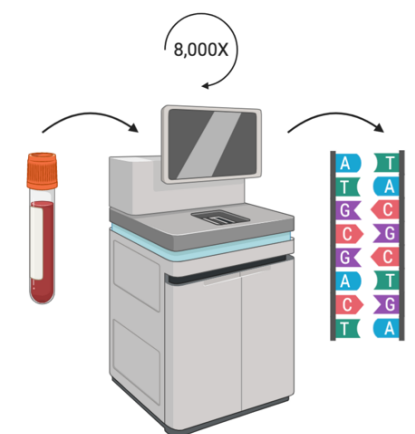
[1] Illumina combined its technology with Solexa's to commercialize the first wave of NGS instruments.

Forecasts are inherently limited and cannot be relied upon. | Source: ARK Investment Management LLC, 2019; "The Cost of Sequencing a Human Genome." Genome.gov, arkinv.st/2SIIMzm. This is not a recommendation in relation to any named securities and no warranty or guarantee is provided. Any references to particular securities are for illustrative purposes only.



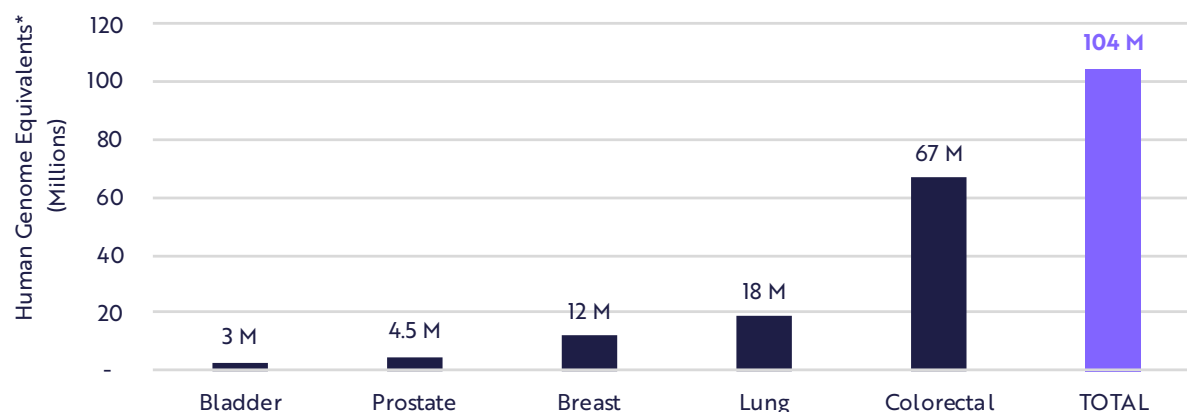
Liquid Biopsies Add to Oncologists' Toolkits

Liquid biopsies sequence tumor-derived DNA fragments (ctDNA) circulating in the bloodstream. Oncologists use this information, matching patients to therapies without the need for invasive tissue biopsies. Clinical trials are under way to increase the utility of liquid biopsies, not only to screen for cancer but also to monitor patients in remission for recurrences. As a result, sequencing intensity is increasing.



Liquid biopsies are sequencing-intensive, meaning that samples need to be analyzed many times for an accurate result.

Recurrence Monitoring Alone Could Magnify Annual Sequencing Volume by Roughly 40X**



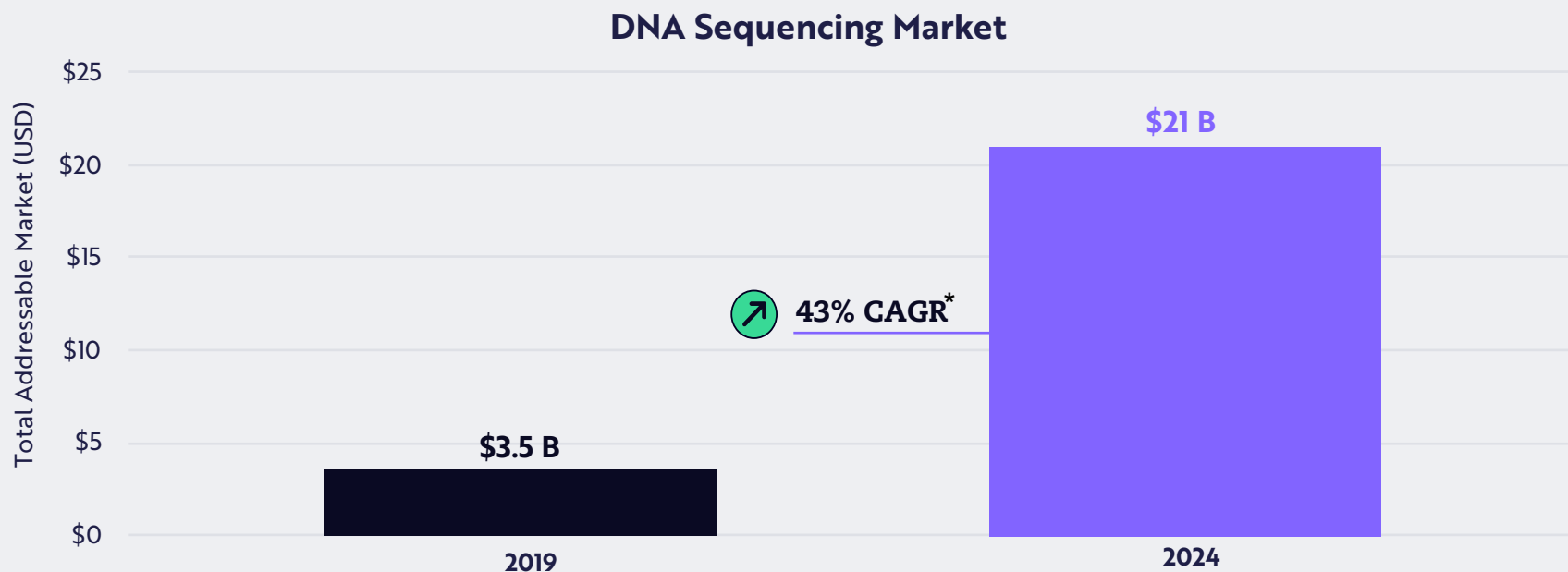
*Human genome equivalents equate to 96 gigabases of sequence data. | **Full penetration of 104 million human genomes is equal to a 40x increase in annual sequencing intensity as measured in 2019 (2.6 million human genomes).

Source: ARK Investment Management LLC, 2019; "Potential Utility of Liquid Biopsy as a Diagnostic and Prognostic Tool for the Assessment of Solid Tumors: Implications in the Precision Oncology," Journal of Clinical Medicine, 18 Mar. 2019, arxiv.org/abs/1903.08882; Chamie, Karim, et al. "Recurrence of High-Risk Bladder Cancer: a Population-Based Analysis." Cancer, U.S. National Library of Medicine, 1 Sept. 2013, arxiv.org/abs/1309.0888; "Bladder Cancer." Mayo Clinic, Mayo Foundation for Medical Education and Research, 22 Dec. 2017, arxiv.org/abs/1712.0888; "Survivorship Care Plans." American Cancer Society, arxiv.org/abs/1712.0888.



Sizing the Opportunity

ARK believes that the average price to sequence a whole human genome will fall to roughly \$200 by 2024.¹ Based on Wright's Law, ARK estimates that NGS revenues could grow at an annual rate of 43%, reaching \$21 billion in 2024.



[1] ARK adjusted its previous cost of \$100 by 2023. We believe market leaders in this space are not lowering costs as quickly as they could. In addition, the average selling price is inclusive of labor, hardware amortization, consumables and other associated costs, as the National Institutes of Healthcare (NIH) recently delineated.

*CAGR: Compound Annual Growth Rate

Forecasts are inherently limited and cannot be relied upon. | Source: ARK Investment Management LLC, 2019



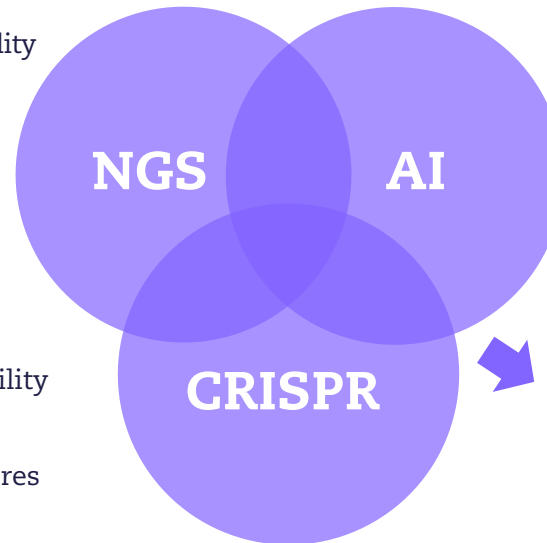
Three Technological Advances Could Boost the Efficiency of Drug Development Radically

Next Generation Sequencing

- Sequences faster and cheaper, with higher fidelity
- Guides patients toward targeted treatments
- Improves clinical trial selection

CRISPR Gene-Editing

- Edits faster and cheaper, with more capability
- Enables earlier experimentation
- Turns chronic conditions into potential cures



Artificial Intelligence

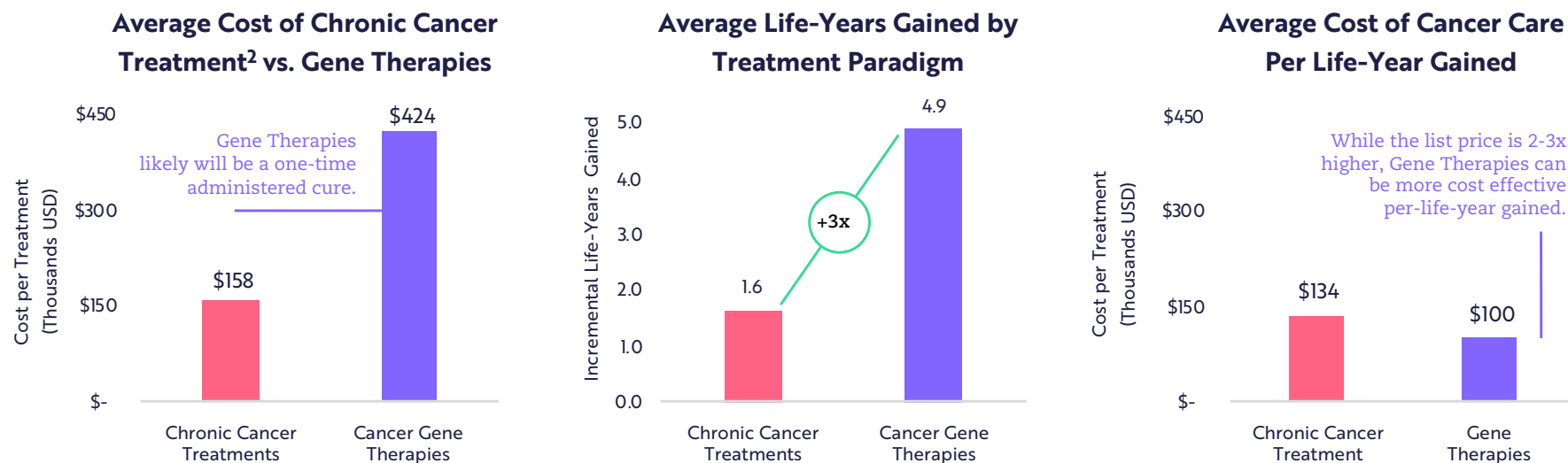
- Accelerates the discovery of drug candidates
- Increases clinical trial participation
- Lowers the cost of sequencing and analysis

Cures for chronic conditions
Fewer failures in drug development
Shorter development timelines



Curing Disease Comes at a Higher Sticker Price But a Much Better Bang For the Buck

Gene editing promises to transform our ability to create and deliver gene and cell therapies. To date, only 10 therapies have been FDA approved—three of them targeting cancer—but more than 2,000 trials have been registered. Approved by the FDA in the last two years, the first three gene therapies demonstrated high rates of complete remission in liquid tumors at a low cost per "life-year".¹



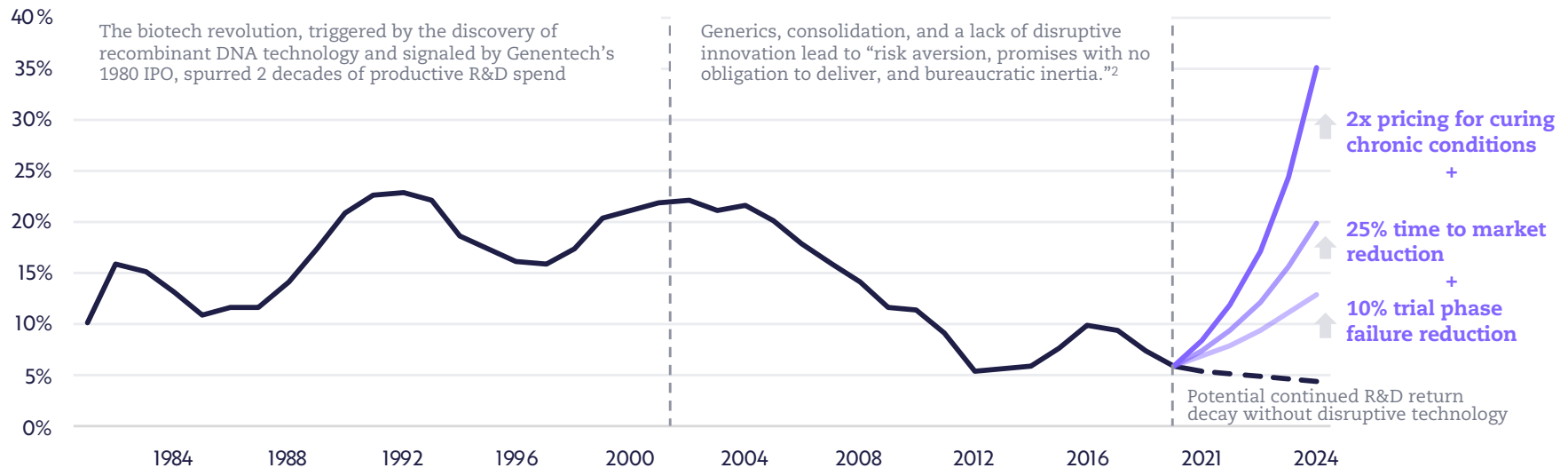
[1] Life-year: Year of survival while on therapy. | [2] Chronic cancer treatments include treatments approved 2014 to 2019. Source: ARK Investment Management LLC, 2019; Biologics Evaluation and Research. "Approved Cellular and Gene Therapy Products." U.S. Food and Drug Administration, FDA, [arkinv.st/37LrKQh](https://www.fda.gov/oc/arkiv/st/37LrKQh); Shahryari, Alireza, et al. "Development and Clinical Translation of Approved Gene Therapy Products for Genetic Disorders." Frontiers, Frontiers, 20 Aug. 2019, [arkinv.st/39MZ0xg](https://www.frontiersin.org/articles/10.3389/fgen.2019.00020).



The Combination of Sequencing, Editing and AI Could Reverse Decaying Returns on Therapeutic R&D

A marginal increase in clinical trial success rates coupled with an increase in trial throughput and the premium pricing afforded to curative therapies could catalyze returns to R&D not seen since the biotech revolution.

Pharma and Biotech: Returns on Drug R&D¹ and Potential Trajectories
(5 Year Moving Average)



[1] Returns on Drug R&D = The rate of return, less the risk-free rate, on the R&D dollars spent (inclusive of drug failures) in the years leading up to drug releases and associated present value of earnings in any given year. [2] Garnier, J-P. 2008. Rebuilding the R&D Engine in Big Pharma. Harvard Business Review May 2008.

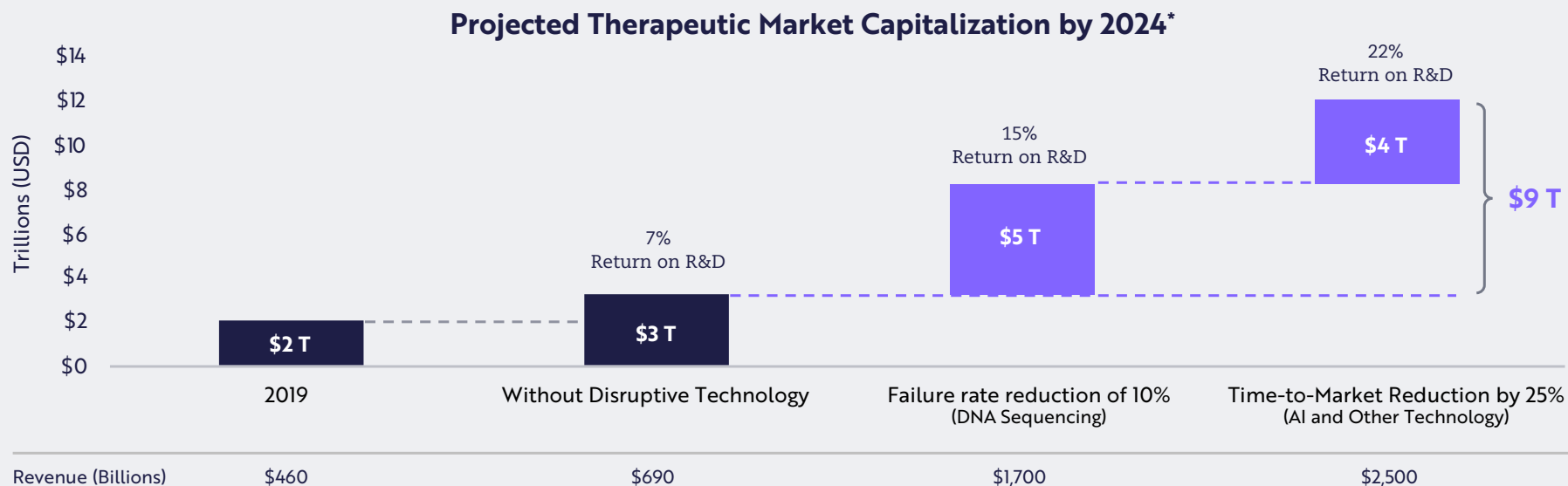
Forecasts are inherently limited and cannot be relied upon.

Source: ARK Investment Management LLC, 2019; Garnier, Jean-Pierre. "Rebuilding the R&D Engine in Big Pharma." Harvard Business Review, 1 Aug. 2014, arkinv.st/37JCLlp.



Sizing the Opportunity

Improvements in R&D efficiency could add \$9 trillion to the market capitalization of therapeutics companies during the next 5 years.



*Assumes no change in price to sales multiple for the biotech sector, market cap expectations based on expected incremental sales generated from associated R&D spend accounting for likely revenue declines from patent and exclusivity expirations. Based on extensive analysis and reconstruction of historical R&D spend and associated revenue yields. | Forecasts are inherently limited and cannot be relied upon.

Source: ARK Investment Management LLC, 2019; Garnier, Jean-Pierre. "Rebuilding the R&D Engine in Big Pharma." Harvard Business Review, 1 Aug. 2014, [arkinv.st/37JCLP](https://hbr.org/2014/08/rebuilding-the-rd-engine-in-big-pharma).



5 Reasons Investors Should Consider ARKG

1. **Exposure To Innovation:** Aims for thematic multi-cap exposure to innovative elements including gene therapy bio-informatics, bio-inspired computing, molecular medicine, and pharmaceutical innovations.
2. **Growth Potential:** Aims to capture long-term growth with low correlation of relative returns to traditional growth strategies and negative correlation to value strategies.
3. **Tool For Diversification:** Offers a tool for diversification due to little overlap with traditional indices. It can be a complement to traditional value/growth strategies.
4. **Grounded In Research:** Combines top-down and bottom-up research in its portfolio management to identify innovative companies and convergence across markets.
5. **Cost Effective:** Seeks to provide a lower cost alternative to mutual funds with true active management in an exchange traded fund (ETF) that invests in rapidly moving themes.



ARK Genomic Revolution ETF (ARKG)

Genomic sequencing is changing the way biological information is collected, processed, and applied. ARKG is focused on the disruptive innovations that are increasing precision, restructuring health care, agriculture, pharmaceuticals, and enhancing the quality of life.

- Ticker: **ARKG**
- Fund AUM: **\$2.3 Billion**
- Holdings: **30-50 U.S. Equities/U.S.-listed ADRs**
- Expense Ratio: **0.75%**

TOP 10 HOLDINGS

	Weight
INVITAE CORP	12.0%
CRISPR THERAPEUTICS AG	8.1%
PACIFIC BIOSCIENCES OF CALIF	5.6%
TWIST BIOSCIENCE CORP	4.7%
ARCTURUS THERAPEUTICS HOLDIN	4.7%
COMPUGEN LTD	4.4%
SERES THERAPEUTICS INC	3.7%
IOVANCE BIOTHERAPEUTICS INC	3.5%
TELADOC HEALTH INC	3.3%
PERSONALIS INC	3.1%
	53.1%

MARKET CAPITALIZATION

Mega (\$100B+)	0.0%
Large (\$10-\$100B)	16.4%
Medium (\$2-\$10B)	41.2%
Small (\$300M-\$2B)	39.3%
Micro (\$50-\$300M)	2.6%

PORTFOLIO COMPOSITION

Molecular Diagnostics	23.5%
Beyond DNA	17.0%
Gene Therapy	13.7%
Instrumentation	12.5%
Bioinformatics	12.0%
Targeted Therapeutics	11.4%
Next Generation Oncology	8.0%
Agricultural Biology	1.2%
Stem Cells	<1%

SECTORS

Health Care	95.9%
Information Technology	3.5%
Not Classified	0.6%

Holdings are subject to change and should not be considered as investment advice, or a recommendation to buy, sell or hold any particular security. The securities identified do not represent all of the securities purchased, sold or recommended for client accounts. It should not be assumed that an investment in the securities identified was or will be profitable.

Source: ARK Investment Management LLC; All data as of September 30, 2020.



Thematic Strategies Focused on Disruptive Innovation



ARKK
ARK Innovation ETF



PRNT
The 3D Printing ETF



ARKW
ARK Next Generation Internet ETF *



IZRL
Israel Innovative Technology ETF



ARKQ
ARK Autonomous Tech. & Robotics ETF *



ARKG
ARK Genomic Revolution ETF



ARKF
ARK Fintech Innovation ETF

*Effective as of November 4, 2019, the name of the ARK Web x.0 ETF changed to the "ARK Next Generation Internet ETF" and the name of the ARK Industrial Innovation ETF changed to the "ARK Autonomous Technology & Robotics ETF."



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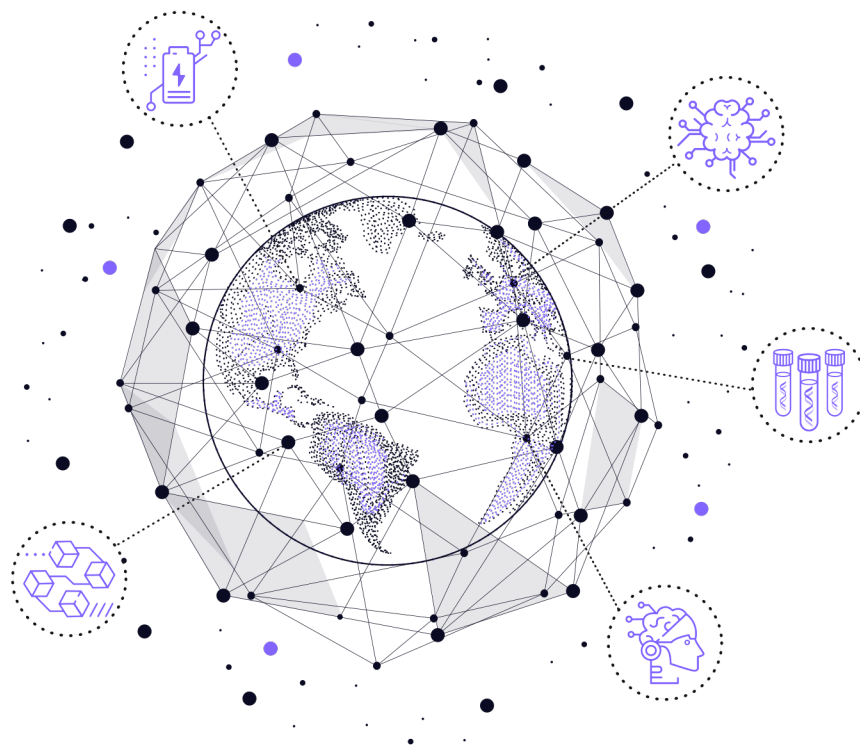
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Factsheet, prospectus, and latest performance reports are available for download on our website: ark-funds.com/investor-material

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Investors should carefully consider the investment objectives and risks as well as charges and expenses of an ARK ETF before investing. This and other information are contained in the ARK ETFs' prospectuses, which may be obtained by visiting www.ark-funds.com. The prospectus should be read carefully before investing.

Fund Risks: The principal risks of investing in ARKG: **Equity Securities Risk.** The value of the equity securities the Fund holds may fall due to general market and economic conditions. **Foreign Securities Risk.** Investments in the securities of foreign issuers involve risks beyond those associated with investments in U.S. securities. **Health Care Sector Risk.** The health care sector may be adversely affected by government regulations and government health care programs, restrictions on government reimbursements for medical expenses, increases or decreases in the cost of medical products and services and product liability claims, among other factors. Many health care companies are heavily dependent on patent protection and intellectual property rights and the expiration of a patent may adversely affect their profitability. **Biotechnology Company Risk.** A biotechnology company's valuation can often be based largely on the potential or actual performance of a limited number of products and can accordingly be greatly affected if one of its products proves, among other things, unsafe, ineffective or unprofitable. Biotechnology companies are subject to regulation by, and the restrictions of, the U.S. Food and Drug Administration, the U.S. Environmental Protection Agency, state and local governments, and foreign regulatory authorities. **Pharmaceutical Company Risk.** Companies in the pharmaceutical industry can be significantly affected by, among other things, government approval of products and services, government regulation and reimbursement rates, product liability claims, patent expirations and protection and intense competition. Detailed information regarding the specific risks of ARKG can be found in the ETF's prospectus. Additional risks of investing in ARKG include Foreign Securities Risk, Information Technology Sector Risk, equity, market, management and non-diversification risks, as well as fluctuations in market value and NAV.

The Adviser expects to invest at least 80% of the Fund's assets in Genomics Revolution Companies. However, certain of these companies do not currently derive a substantial portion of their current revenues from genomic-focused businesses and there is no assurance that any company will do so in the future, which may adversely affect the ability of the Fund to achieve its investment objective.

An investment in an ETF is subject to risks and you can lose money on your investment in an ETF. There can be no assurance that the ETF will achieve its investment objective. The ETF's portfolio is more volatile than broad market averages. Shares of ARKG are bought and sold at market price (not NAV) and are not individually redeemed from the ETF. ETF shares may only be redeemed directly with the ETF at NAV by Authorized Participants, in very large creation units. There can be no guarantee that an active trading market for ETF shares will develop or be maintained, or that their listing will continue or remain unchanged. Buying or selling ETF shares on an exchange may require the payment of brokerage commissions and frequent trading may incur brokerage costs that detract significantly from investment returns.

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Percentages shown for each ARK ETF's Top Ten holdings are based on the ARK ETF's total investments. The securities identified and described do not represent all of the securities purchased, sold or recommended for client accounts. The reader should not assume that an investment in the securities identified was or will be profitable. Portfolio Composition categories are determined by ARK Invest. Portfolio holdings will change and should not be considered as investment advice or a recommendation to buy, sell or hold any particular security. Please visit www.ark-funds.com for the most current list of holdings for the ARK ETFs.

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