

Genomics

An introduction to investing in a rapidly expanding sector

Garrett Ruhl, Investing Potpourri July 2021

What are genomics?

A sector within healthcare

Not biotech, but DNA

(precise health care versus hospitals, instruments, supplies, tests, or drugs)

2020 Nobel Prize in Chemistry for DNA — specific correction.

FDA approvals, expensive, broad potential

Attributes of early stage genomics companies?

Investing in Genomics

Characteristics

High risk/ speculative, capital gains rather than income

Small/medium sized, often undercapitalized, new firms face dilution

High R&D, heavy FDA regulation, hard phases test process (8 % meds pass Phase I efficacy in humans)

Intellectual property under patent could be hacked

Ultra narrow sales expand into uncertain broad applications

Not insured or Medicare approved as yet, MDs adapt slowly on evidence in patients

Low share of a portfolio, news tracking is intensive

“Success“ is often a buy-out or coproduction with big Pharma

The Science

What have we learned?

That Science . *Genetics 101* Windelspecht .

The Code Breaker, Walter Issacson on Doudna Nobel . synthetic biology of 3 billion human genes

AI acceleration of reading a gene test, 10 to power 10+ .

No designer babies or superheroes, public observed ethics .

Crispr People, Henry Greely 2021 .

How . Insertion of a functional gene(s) in a virus mRNA . clustered regularly interspaced short palindromic repeats [CRISPr / Cas9](#) system.

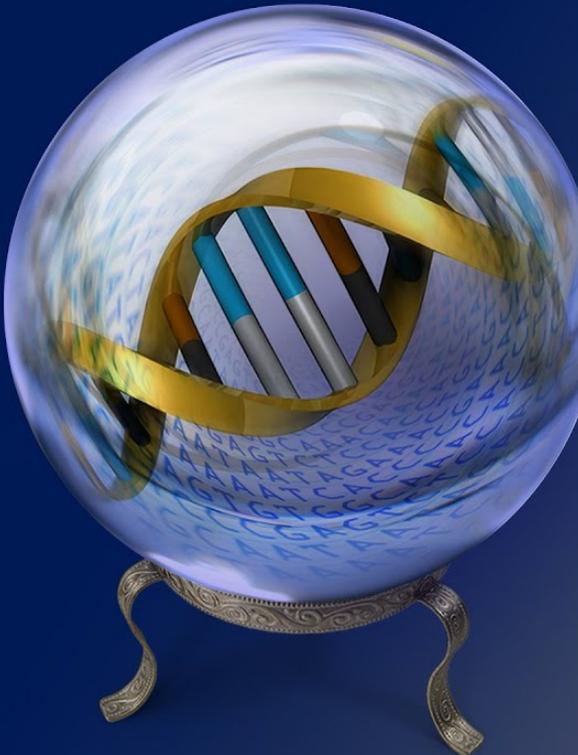
In vivo . ” One and Done . “

Eliminate inevitable diseases, life dependency, suffering, idleness .

“ Rare “ disease in USA < 200k, global millions .

Pandemic proves mRNA .

NIH National Human Genome Research Institute NHGRI



NIH National Human Genome
Research Institute

The **Forefront**
of **Genomics**

NHGRI Seminar Series

Bold Predictions for Human Genomics by 2030

Generating and analyzing a complete human genome sequence will be routine for any research laboratory, becoming as straightforward as carrying out a DNA purification.

Evan Eichler, Ph.D.
University of Washington

Karen Miga, Ph.D.
University of California, Santa Cruz

Bold Predictions for Human Genomics by 2030: Session 1

Genomics Stocks

In the news

Bluebirdbio / BLUE

Moderna / mRNA

Denali / DNLI

Regeneron / REGN

Intellia / NTLA.

Crispr Therapeutics / CRSP

ARKG

Top 10 Holdings

As of 7/19/2021

 [View All Holdings](#)

Weight	Company	Ticker	Market Price	Shares Held	Market Value
6.76%	TELADOC HEALTH INC	TDOC	\$146.78	3,907,621	\$573,560,610.38
5.24%	EXACT SCIENCES CORP	EXAS	\$114.00	3,899,302	\$444,520,428.00
4.73%	REGENERON PHARMACEUTICALS	REGN	\$583.24	688,033	\$401,288,366.92
4.14%	PACIFIC BIOSCIENCES OF CALIF	PACB	\$26.48	13,265,460	\$351,269,380.80
4.09%	VERTEX PHARMACEUTICALS INC	VRTX	\$202.28	1,713,504	\$346,607,589.12
3.84%	CAREDX INC	CDNA	\$78.83	4,129,615	\$325,537,550.45
3.83%	FATE THERAPEUTICS INC	FATE	\$78.54	4,132,505	\$324,566,942.70
3.71%	IONIS PHARMACEUTICALS INC	IONS	\$36.55	8,604,006	\$314,476,419.30
3.31%	TWIST BIOSCIENCE CORP	TWST	\$112.11	2,506,487	\$281,002,257.57
3.12%	NOVARTIS AG-SPONSORED ADR	NVS	\$91.70	2,887,155	\$264,752,113.50

Compare ARKG to XBI



ARKG	XBI
1 Month	1 Month
-3.71%	-5.61%
3 Months	3 Months
-8.81%	-5.65%
YTD	YTD
-11.67%	-10.52%
1 Year	1 Year
44.28%	7.66%
3 Years	3 Years
40.14%	7.90%
5 Years	5 Years
37.64%	17.33%
10 Years	10 Years
--	18.07%

* Performance as of 07/16/21

Sources

Where to find information

Generally use Google for terms

[BioSpace.com](http://www.biospace.com) for hard news

PubMed for articles

Medical and analyst conferences

WHO

NIH

[Medlineplus.gov/genetic](http://medlineplus.gov/genetic)

Questions?