



Innovation Drives Health Care Sector's Response to Pandemic

We may be on the cusp of a sea change in medicine.

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KEY INSIGHTS

- The health care sector's rapid response to the coronavirus pandemic highlights the accelerating pace of innovation in the space.
- Gene sequencing and other scientific breakthroughs over the past 20 years could set the stage for a transformative decade in health care.
- A rapidly expanding universe of investable companies and innovation-driven disruption could favor stock pickers with deep scientific and industry knowledge.

Encouraging progress in the race to develop an effective vaccine for COVID-19, the disease caused by the coronavirus, could bode well for efforts to stem the pandemic and support a broader recovery in the economy.

We believe the biopharma and health care services industries' relatively rapid response in battling the coronavirus illustrates the innovation in the health care sector more broadly.

Amid this rapid change, we think that our investment team's diverse scientific and medical backgrounds, coupled with our prudent investment approach, give us an edge in identifying companies that should benefit from this wave of innovation.

Pandemic Solutions: Darkest Before the Dawn

Tragically, the rising number of coronavirus infections and the approach of winter—usually the peak transmission period for respiratory ailments—suggest

that the next two to three months could be the worst of the pandemic.

Despite this sobering near-term outlook, recent developments on the vaccine and treatment fronts give us hope that we are closer to the beginning of the end of the pandemic. COVID-19 is unlikely to be eliminated completely, but there are signs that the disease could become significantly more manageable.

Early data from trials of potential vaccines based on messenger ribonucleic acid (mRNA)—an intermediary that transmits information encoded in our DNA to proteins that carry out specified actions—have demonstrated high efficacy rates in preventing COVID-19 infection. Fundamentally, these mRNA-based vaccines aim to enable the body to produce its own protein therapeutic to fight the virus.

Questions remain about the duration of the immunity created by these



Ziad Bakri

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Multiple Shots on Goal

A selection of coronavirus vaccine candidates.

Companies	Technology	Start Date for Phase 2 or 3 Clinical Trial	Pivotal Data Release ¹
Pfizer/BioNTech	mRNA	Jul. 2020	Nov. 2020
Moderna	mRNA	Jul. 2020	Nov. 2020
AstraZeneca	Adenoviral Vector	Sep. 2020	4Q 2020
Johnson & Johnson	Adenoviral Vector	Sep. 2020	Early 2021
Cansino	Adenoviral Vector	Aug. 2020	1Q 2021
Novavax	Subunit	Sep. 2020	1H 2021
Sanofi/GlaxoSmithKline	Subunit	Dec. 2020	1H 2021
Inovio	DNA	Sep. 2020	1H 2021
CureVac	mRNA	Year-End 2020	1H 2021
Merck/Themis	Subunit	Year-End 2020	1H 2021
Merck/IAVI	rVSV	1H 2021	1H 2021
Sanofi/Translate Bio	mRNA	2Q 2021	4Q 2021

As of October 31, 2020.

Sources: T. Rowe Price, Centers for Disease Control, and company reports.

See Additional Disclosures at the end for more information.

¹ Estimated timing of key readouts from clinical trials, based on publicly available data. These estimates are subject to change.

Pfizer and Moderna had a pivotal data release in November 2020.

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fast-tracked vaccine candidates. We're also mindful that mutations in the virus could reduce the efficacy of the therapies currently in development.

Fortunately, the virus appears to have remained relatively stable thus far—unlike the flu, which mutates quickly. The global biopharma complex is also pursuing about a dozen different vaccine candidates, giving humanity multiple shots on goal, so to speak. Although infection rates are soaring, it appears that behavioral changes, such as physical distancing and increased wearing of face masks, as well as advances in the medical community's understanding and treatment of COVID-19, have helped to reduce the disease's mortality rate.

Innovation, Accelerated

That the biopharma industry has leveraged a diverse slate of technologies and platforms to develop the many

potential candidates for COVID-19 vaccines and therapies—compressing into mere months a process that, in the past, could have taken a decade—is a testament to the scientific advances of the past 20 years.

This impressive feat potentially could engender a favorable regulatory climate for drug approvals, while the pandemic may also prompt governments and the industry to take a more proactive approach to investment in diagnostics, vaccines, and treatments for infectious diseases.

Beyond drug development, the virus accelerated the adoption of “telehealth” services and other types of virtual health care. Remote monitoring of patients with chronic diseases and the adoption of telemedicine as a replacement for some in-person doctor visits, as well as the shift of less-acute care from the hospital to the home and outpatient centers,

Staying on Top of Innovation

Dr. Ziad Bakri explains how he and his team identify the small- and mid-capitalization biotech companies that could have what it takes to grow much larger.

The bulk of the overall returns in the rapidly expanding universe of biotechnology stocks are driven by a relatively small portion of these companies. In the mid-cap universe, we seek to identify the names where we have a degree of confidence that the repeatability of their platform gives them the potential to enter large-cap territory. Among small-cap biotech companies, we seek out developers of therapeutics in which the market may have not realized the company's potential to build a much larger franchise.

Although the pandemic has limited our team's travel and in-person meetings, we stay in contact with senior executives and talk regularly with others in health care to find new investment ideas and validate our assumptions. Our investment team's diverse scientific and medical backgrounds and deep contacts within industries and academia help them determine if a company's story has potential or is overly promotional.

generally have proved convenient, efficient, and economical.

On the Cusp of a Sea Change in Health Care

The health care sector, in our view, could be on the cusp of a transformative decade during which scientific and technological breakthroughs of the past 20 years could begin to bear fruit in the form of new treatments that help address unmet clinical needs and improve patients' quality of life.

This sea change could be akin to the evolution of the internet, a significant innovation that did not mean much to many people's daily lives for some time but grew to be indispensable as widespread connectivity and low-cost computing power enabled the development of today's most popular applications.

Consider genetic sequencing, a capability that existed 20 years ago but has become much cheaper with advances in science and technology, reaching the point that we can sequence the genomes of mass populations—as deCODE famously did in Iceland—to

unlock powerful insights. By analyzing these troves of genetic data and health records, we can identify mutations in people who did not develop Alzheimer's disease (or other chronic ailments) and leverage these findings to develop better diagnostics, treatment plans, and potential therapeutics. So-called liquid or fluid biopsies, for example, are blood tests that can detect certain cancers before the symptoms manifest themselves by identifying biomarkers associated with tumor development.

Biopharma's toolkit has expanded beyond small molecules and targeted antibodies, with a wide range of areas showing potential promise, including therapies that engineer cells to kill cancer or gene-editing technologies that seek to correct disease-causing genetic mutations. Medicines based on mRNA turn the body into a bio-factory to produce its own drugs, while precision tissue delivery can transport therapeutic payloads to highly targeted areas, potentially improving efficacy and minimizing harmful side effects. Protein degraders are another class of emerging treatments that eliminate specific

disease-causing proteins, potentially leading to therapies for ailments previously deemed “undruggable.”

In the coming years, advances in artificial intelligence and machine learning could also incrementally improve the success rate of new treatments by processing an array of factors to help identify the best chemical series to bring to trial.

Selectivity Is Key for Health Care Investors

This wave of innovation in health sciences, especially biopharma, has led to a proliferation of small companies leveraging emerging technologies and therapeutic methods, with an increasing number entering the public market at earlier stages in their development. This year, more than 70 biotechnology companies had completed their initial

public offerings (IPO) through the end of October, an acceleration relative to 2019.

Ready access to capital is critical to driving innovation, but the ever-expanding universe of public companies and accelerating disruption create challenges for investors. Among the roughly 435 biotech IPOs that took place from 2013 to the end of October, a mere 10 stocks accounted for more than 60% of the returns generated by this cohort.

We believe that this divergent performance favors active management and that our deep investment team, which includes experienced analysts with backgrounds in science and medicine, should give us an edge in identifying the names whose technologies, large addressable markets, and management teams give them a chance of growing to become much bigger companies.

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Additional Disclosures

Adenoviral vectors are harmless viruses that are genetically engineered to produce characteristics of the target virus. Vaccines developed using this technology could help the patient's immune system to identify and attack the targeted virus upon exposure.

Subunit vaccines contain only the components of the pathogen that best stimulate a protective response from the patient's immune system.

DNA, or deoxyribonucleic acid, is a molecule containing genetic instructions.

The rVSV (replicating vesicular stomatitis virus) vaccine technology uses a genetically engineered version of an animal virus that primarily affects cattle.

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