
WHEN MULTIPLE MEGATRENDS COLLIDE, LIVES MIGHT BE SAVED

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The big story of this moment in human history is what [WisdomTree BioRevolution ETF](#) partner Jamie Metzl calls “superconvergence.” The technologies of the AI, genetics and biotechnology revolutions are inspired by each other and, in turn, inspire each other, continuously accelerating innovation and impact.

These impacts are being seen in many different sectors, including Health Care.

On December 14, 2023, Moderna reported data from an ongoing, early-stage trial for a personalized therapy meant to counteract late-stage melanoma, an often deadly type of skin cancer. CEO Stephane Bancel described the approach in quite an interesting way in an interview he did on CNBC to discuss the results:¹

- Cancer cells are typically subject to mutations within the patient’s DNA, which may be helping create conditions for cancer to flourish.
- Moderna is able to use AI analytics and massive cloud computing power to analyze the sequenced DNA data derived from both cancerous cells and the healthy cells around them.
- Moderna’s algorithm compares the cancerous DNA code to the healthy DNA code in order to help scientists understand how the cancer cells are mutating.
- This information is then used to identify unique elements of the cancer cells that could be targets for a patient’s natural immune system.
- A therapy custom-designed to trigger the patient’s own immune system to attack the specific target in the cancer cells can then be created and delivered using the same mRNA technology underpinning the COVID-19 vaccines, essentially training the patient’s individual immune system to attack the unique cancer. It’s a personalized cancer vaccine.
- Remarkably, this personalized cancer therapy can be ready for use just 30 days after the patient’s cells are extracted and sequenced, thanks to the combined tools of the AI, genetics and biotechnology revolutions.

Moderna reported that after three years of trials, this therapy, mRNA-4157, in combination with Merck’s blockbuster cancer drug, Keytruda, reduced the risk of recurrence or death by 49% in late-stage melanoma patients compared with Keytruda alone. The combination reduced the risk of developing distant metastasis or death by 62% compared with Keytruda alone.² These results are nothing short of astounding.

It sounds like science fiction, but miracles like this are increasingly the future of medicine, agriculture, materials science, data storage and other fields.

BioRevolution→AI→Cloud Computing

Moderna is pivoting from its massive success in rapidly producing its revolutionary COVID-19 mRNA vaccine to becoming a platform company upon which many different goals can

be achieved using mRNA therapies.

Its cloud service provider, Amazon Web Services, is the world's largest public cloud platform, with a roughly 40% market share. A unique value of these platforms is that a company like Moderna can never buy, on its own, the most advanced computational infrastructure that would allow for individual patient genomes to be analyzed with the depth, speed and scale that is possible through its partnership with AWS. Working with AWS provides Moderna with a suite of AI and machine learning tools to better process data to derive actionable insights and targeted capabilities.

So, we are seeing something that represents the intersection of three megatrends: 1) BioRevolution, 2) artificial intelligence and 3) cloud computing. Many are thinking about the future of medicine going from generic treatments—like everyone taking the same Advil for a headache—to personalized medicine that recognizes each person is unique and can be treated differently. At the center of that transition is data, and when data is involved, you usually also see the cloud and AI in the background.

Conclusion: Biotech for 2024

We have already written about biotechnology as an area that is coming off of rather extreme underperformance. We've been seeing a lot of articles focused on interest rates; namely, if rates are trending more downward than upward, this can help the overall biotechnology area, as falling rates, historically, have been more associated with positive returns.

While we think the macroeconomic dynamic is important, it's also important to recognize that science is continuing to advance at astounding rates. Even if there are ups and downs in some of the markets, the exponential growth of the capabilities driving massive societal change is undeniable. We wrote recently about a [new CRISPR therapy, Casgev](#), for sickle cell anemia, and now here we have an mRNA example. We are excited that a more positive macro environment might coincide with improvements in AI and cloud computing that allow for the continued acceleration of efforts for taking these therapies to more widespread use. Given that there are thousands of such therapies in the approval pipeline, the chances of this progress are significant. Moderna itself has some 40 different therapies in its pipeline, seven of them late stage.

To potentially capitalize on these trends, the [WisdomTree BioRevolution Fund](#) is worth taking a deeper look at.

¹ Source: "Moderna CEO Stephane Bancel on melanoma treatment development: A big day for patients," YouTube, uploaded by CBNC Television, 12/14/23. <https://www.youtube.com/watch?v=8oVRYQe2bX8>.

² Source: Josh Nathan-Kazis, "Moderna Reports More Promising Data on Its Cancer Treatment. The Stock Jumps," Barron's, 12/14/23.

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