

A CONVERSATION WITH JAMIE METZL ON THE BIOREVOLUTION

Christopher Gannatti — Global Head of Research

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Recently, we had the pleasure of speaking with Jamie Metzl, Founder and Chair of One Shared World, and author of the book, *Hacking Darwin*, which illustrates many of the advances in our ability to use the information encoded in DNA.

The topic: how the coming decades could very well be determined by the unique array of advancements we are on the precipice of making within the space we call the 'BioRevolution.' We think this could be one of the defining megatrends of the coming decades, in that, as people think about health and sustainability, advances in certain critical areas will be essential.

Jamie noted that he has been on the leading edge in certain areas under discussion, particularly as a member of the World Health Organization's expert advisory committee on human genome editing. This committee was created after the birth in China of the first human babies with genes edited via CRISPR technology, to figure out how these very powerful tools can be best deployed for the greatest good.

Roughly 20 years ago, we were seeing the results of the Human Genome Project, and it is a process that has only improved and become more efficient as the years have gone by. Additionally, we note there is intersectionality between the advancements in generative [artificial intelligence \(AI\)](#) (systems like ChatGPT and Progen) and the possibilities available in engineered biology. In fact, Jamie is working on a new book, to be published next year, called *The Great Biohack: Recasting Life in an Age of Revolutionary Technology*.

Human History Is a Series of Inflection Points

Progress tends not to occur in a smooth line, with regular advances per unit of time, but rather in big step changes. One of those changes was agriculture, when instead of existence relying on finding enough food, food supplies were secured. This meant labor could be divided, such that a part of the population could tend to the farms and another part could focus elsewhere. Another of those changes was industrialization...another was the internet.

In each case, the ways in which humans spend their time as well as what type of outputs they could produce with that time has changed. In 2023, we are seeing advances in:

- Artificial intelligence
- Genetics
- Biotechnology
- Nanotechnology

And that only names a few. Sometimes people see these as separate, but we can also think of them as parts of the same, bigger technological advance. If we are trying, for instance, to cure a disease, now there could be more tools. If we are trying to have more and better food, now there could be more tools. It's all about getting more and more tools over time that can be used to help solve these very important issues.

Generative AI Moment

Generative AI systems are designed to look at massive fields of data and come up with statistical predictions about what follows. When this is applied to the internet and written language it creates the experience that many have had with ChatGPT.

But, biology is also its own language, to the extent we all know in spoken or written language the range of things that 'make sense' and the range of things that 'appear incorrect.' We are learning more about the languages of:

- Biology
- Genetics

- Chemistry
- Proteins

If the current large language models can train on the language of these specific disciplines, it is possible they could already suggest potentially interesting outputs, be it new molecules, interesting proteins or even possible drug therapies.

Proteins are a particularly interesting area. It's not only about knowing the amino acids and the sequence or the order—it is also about knowing the structure, because there is a close relationship between structure and function. In 2022, DeepMind released predictions for the structure of more than 200 million proteins—a number that is growing all the time. Meta was able to release structure predictions for something close to 600 million proteins.

AI is not—yet—creating novel drugs in the market, fully approved, from end to end. However, the overall drug development process could be done in less time (the average is around 10 years), for less money (average: \$2 billion) and with a lower failure rate (average: 96% failure), so this potential could be quite impactful.

Conclusion: So Much Will Change in the Coming Decades...

At WisdomTree, when we think of the BioRevolution, we think of four areas:

1. Human health
2. Agriculture and food
3. Materials, chemicals and energy
4. Biological machines and interfaces

There is simply too much happening in each of these areas to cover in a short written piece, but we note two things for anyone looking to delve a bit further:

1. The full video and transcript of the conversation we had with Jamie Metzl is available [here](#).
2. Further information on the WisdomTree BioRevolution Fund (WDNA) is available [here](#).

For the top 10 holdings of WDNA please visit the Fund's fund detail page at <https://www.wisdomtree.com/investments/etfs/megatrends/wdna>

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Artificial intelligence : machine analysis and decision-making.