



mRNA Technology- Once a Rejected Idea is Now Becoming the Winner in the COVID-19 Vaccine Combat

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“Moderna” and “Pfizer” are the most discussing companies in the present world in terms of the vaccination campaign against COVID-19. The gigantic 171 years old Pfizer and only 10 years old Moderna are racing forward in the hopes of making history, saving the world, and billions of dollars but in many ways, these two companies share a same commonality. Both of them are developing their vaccines with the help of a genetic technology, called messenger RNA (mRNA) technology, an ingenious technology within the natural substance that directs protein production in cells throughout the body.

But the multibillion-dollar idea of mRNA was once a scientific backwater and it was a dead-end of career for the scientist behind a key mRNA discovery. Very few people are familiar with “Katalin Karikó”, a Hungarian-born scientist who spent the 1990s attempting to harness the power of mRNA to cure diseases. But she and her ideas were rejected by government grants and corporate funding to move forward.

It all once made sense in theory that in the natural world, the body needs millions of small proteins to keep itself alive, and it needs mRNA to instruct cells which proteins to make. If you could control the design of the mRNA, you could have the power to process and create any proteins you want. You can design enzymes to cure rare diseases or you can make antibodies to vaccinate against infections or you might make growth agents to heal damaged kidney tissues. But all these ideas were on paper.

But in 1990, few researchers at the University of Wisconsin made this idea work in mice and that’s the time when the hope of a “Billion dollars idea” saw its very first practical application. Karikó wanted to move forward but she knew that the synthetic RNA is notoriously vulnerable to the body’s natural defense system and will be destroyed before hitting the target and the worse thing is the resulting biological damage might initiate an immune response that could make the therapy hazardous for some patients. It was a real obstacle for her. By 1995, after six years on the path of becoming a full professor, Karikó was demoted for not having funding and support for the mRNA research. But that is a different story for some different times.

However, in time scientists around the globe started taking this idea quite seriously and countless experiments, hypotheses, and ideas came forward to make the synthetic RNA more stable towards the body. Industries realized the power of synthetic RNA in drug discoveries. Tons of money was invested to make the technology successful. Scientists found out the modifications in the molecular level such as nucleoside and/or nucleotide level can increase stability. And this is the way a new era of synthetic RNA was discovered.

These discoveries started publishing in a series of scientific journals starting from 2005 and it was the starting point for the vaccine sprint to come. Although, there are no approved drugs from mRNA technology, the whole scientific community is very optimistic about mRNA. And that optimism made us believe that mRNA could be the

savior of the world against the present pandemic we are facing. This might not approve officially by any agencies but the mRNA vaccines from Moderna and Pfizer are the biggest weapon we got to stop the COVID-19 pandemic. There might be side effects of these vaccines, but the industries are working round the clock to deliver the best quality product. There will be two doses for this vaccine. According to USA Today, 6.5% of people in the US have received at least one COVID-19 shot. About 1.3% of people have received both doses. About 45.9% of the shots distributed haven't been used yet. So, let's all hope for the greater future of mRNA technology.

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