



# A brief look at the COVID-19 mRNA vaccines

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With the pandemic having the world on a chokehold, the race to develop a vaccine form this virus is in full swing, According to WHO, 54 different vaccines under development, with a handful of being certified for human use. In this record-breaking rush new and radical methods are being employed, of which the Messenger RNA (mRNA) vaccines proving to be the most promising.

## What is different about mRNA vaccines?

Previously, vaccines were used to release a harmless or weakened version of the pathogen in our bodies. This virus was then used to train our immune system to defeat its harmful counterpart. mRNA vaccines take a more direct approach. Instead of carrying a weaker strand of the virus, it instructs the mRNA single-stranded molecules naturally present in all of our cells to create a specific protein. Said protein is more or less identical to the one that SARS-CoV-2, but is devoid of the harmful elements and cannot mount a defense against the immune system. After it finishes training our

defense system, it harmlessly dissolves, leaving a healthy body.

## Advantages

There are two parts to our immune system. The first one is innate, these are defenses we are born with. Other is acquired, which we develop after coming into contact with new diseases. A classic vaccine could only work with the acquired part of our system, effectively working at 50% capacity. mRNA however, can be programmed to activate our innate defense system as well, effectively doubling our defense system.

Prof. Isabelle Bekerédjian-Ding is Head of Microbiology at Paul-Ehrlich-

Institut, Federal Institute for Vaccines and Biomedicines, Langen, Germany. In an interview with European Commission Horizon Magazine, she said "All kinds of innate immune cells are being activated by the mRNA. This primes the immune system to get prepared for an endangering pathogen and thus the type of immune response that is triggered is very strong."

In the future, mRNA can theatrically be used to combat even deadlier diseases, such as cancer and HIV.

## Risks

Since mRNA vaccines are only now beginning to be tested in humans, there

are a lot of unknowns regarding the treatment. Misconception regarding its method is also rampant, with miscreants peddling the rumor such as it can alter DNA, something it can not do. More human trials will eliminate the former, while the latter needs to be combatted through education and battling fake news.

Currently, mRNA COVID-19 vaccines by Pfizer and Moderna have undergone safety testing in human clinical trials, with China's Sinovac vaccine is in late-stage trials. If cleared for human use, the easy scalability of this type of vaccine means it might be possible to eliminate the risk of covid by the end of 2021.