

New mRNA Therapies: Good News from Bad News

Many of us have been locked down for more than a year. We've cancelled vacations, restaurant visits and in-person schooling. More than 500,000 of our loved ones across the country have passed away.

Is there any good coming out of the COVID pandemic? Anything at all?

Turns out, there is. The messenger RNA immunization technology that was developed for the Moderna and Pfizer coronavirus vaccines has the potential to revolutionize the way we treat—and prevent—a wide variety of other maladies. Scientists are sequencing HIV, seasonal flu viruses and certain cancers, and identifying snippets of their RNA that could teach your system to fight them off before they can run rampant through your body.

The vaccine approach to the coronavirus uses lipid nanoparticles—essentially fat bubbles—to deliver bits of a disease's genetic material into the body, helping the immune system spot the spike proteins they use to enter human cells. At the moment, Moderna is working on two HIV vaccine candidates: mRNA-1644 and mRNA-1574. The vaccine has been tested successfully in macaque monkeys, which developed neutralizing antibodies that bind to the proteins that HIV uses to enter cells, neutralizing the disease before it can spread. Another mRNA test has protected humanized mice against HIV infection.

Meanwhile, phase 1 clinical trials for more effective seasonal flu vaccines will start this year, and additional RNA vaccines are being developed for mononucleosis, types of lymphoma and nasal cancer. Other experimental cancer vaccines will require doctors to extract tumor samples from the patient, sequence the genome and create a specific RNA therapy that will teach the immune system to destroy the cancer cells—and only the cancer cells. Six of 10 patients in an early trial responded positively to the treatment; in two, the cancer was entirely destroyed, while four others stabilized and had no further cancer progression.

The newly-developed therapies also offer promise in fighting a number of autoimmune diseases, including multiple sclerosis, and a recent mRNA experiment suggests that mRNA treatment can be used to promote the development of blood vessels. An injection might improve outcomes in people undergoing coronary artery bypass surgery.

It is possible that some of these therapies might have happened eventually without the crash COVID vaccine projects, but almost certainly they would not have been in clinical trials this quickly. This doesn't mean we shouldn't mourn the millions of people lost to the pandemic here and abroad, but it's possible that there will be fewer deaths, and diseases, in our future.

Source:

<https://www.poz.com/article/scientists-working-mrna-vaccines-hiv-flu-cancer>

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