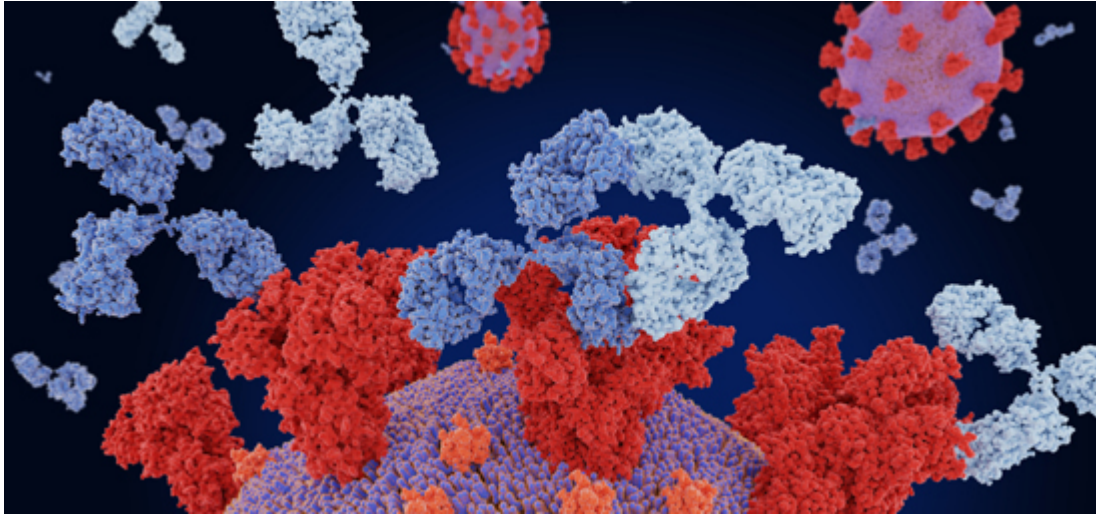


How long do mRNA and spike proteins last in the body?

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Vaccines generally work by introducing a piece of a virus or bacteria into your body so you can develop long-lasting immunity to the pathogen. While the piece introduced by the vaccine rapidly fades away, your body's immune system remembers what it saw. When it encounters the virus or bacteria in the real world it mounts a strong immune response preventing or decreasing the severity of infection.

Some have expressed concern that the spike protein or other parts of the mRNA vaccines build up in the body, particularly in the ovaries or the brain. Here we break down the data to show where mRNA vaccines (and spike proteins) travel in the body. There is no evidence that any mRNA or protein accumulates in any organ.

Why do they use spike proteins?

For COVID-19 vaccines, all of the approved vaccines so far used the spike protein. The spike protein is located on the outside of a coronavirus and is how SARS-CoV-2 (the coronavirus) enters human cells. Its location on the outside of the virus makes it so the immune system can recognize it easily.

The spike protein is unique to SARS-CoV-2 – it doesn't look like other proteins your body makes. So antibodies created against the spike protein won't harm your body, they will only target coronavirus.

How long mRNA lasts in the body

The Pfizer and Moderna vaccines work by introducing mRNA (messenger RNA) into your muscle cells. The cells make copies of the spike protein and the mRNA is quickly degraded (within a few days). The cell breaks the mRNA up into small harmless pieces. mRNA is very fragile; that's one reason why mRNA vaccines must be so carefully preserved at very low temperatures.

How long do spike proteins last in the body?

The Infectious Disease Society of America (IDSA) estimates that the spike proteins that were generated by COVID-19 vaccines last up to a few weeks (<https://www.idsociety.org/covid-19-real-time-learning-network/vaccines/vaccines-information-faq/>), like other proteins made by the body. The immune system quickly identifies, attacks and destroys the spike proteins because it recognizes them as not part of you. This "learning the enemy" process is how the immune system figures out how to defeat the real coronavirus. It remembers what it saw and when you are exposed to coronavirus in the future it can rapidly mount an effective immune response.

The Novavax vaccine introduces the actual protein into your body to produce an immune response similar to many other vaccines currently in use.

Where does the vaccine go?

Here's a peer-reviewed study (<https://www.sciencedirect.com/science/article/pii/S2211124720302928>) that shows where intramuscular vaccines (which all three of the COVID-19 vaccines are) travel in macaques (a type of monkey). Vaccines mostly remain near the site of injection (the arm muscle) and local lymph nodes.

This makes sense: Lymph nodes produce white blood cells and antibodies to protect us from disease. A key part of the lymphatic system, lymph nodes also clean up fluids and remove waste materials. Finding pieces of spike protein in the lymph nodes is completely normal, because lymph nodes act as the trash removal service for the body. That means the vaccine did its job (made spike proteins, which caused the creation of antibodies) and will be cleared from the body.

Another peer-reviewed study

(<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5475249/>) tested exactly where an mRNA vaccine went in mice. Most of the mRNA vaccine stayed in the injection site muscle – where you get the shot. Look at Table 1. A lot of mRNA vaccine was found in local lymph nodes, which peaked about eight hours after the shot was given. A much smaller amount of mRNA vaccine went to farther away lymph nodes.

Can the COVID-19 vaccines change your DNA?

No. COVID-19 vaccines cannot change your DNA.

DNA is stored in the nucleus of your cells. mRNA vaccines do their work outside of the nucleus (in a space called the cytoplasm) and have not been observed to interact with the nucleus. The cell breaks down and gets rid of the mRNA soon after it's finished using the instructions.

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I have read that the vaccine causes infertility. That would be devastating. I guess it interferes with the formation of the placenta.

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