



Learn About the New mRNA COVID-19 Vaccines

The first two COVID-19 vaccines expected to receive authorization for use in the United States are what is known as messenger RNA vaccines—also called “mRNA” vaccines.

- You and your patients may have questions about how mRNA vaccines work and how safe they are.
- Like all vaccines, these COVID-19 mRNA vaccines were tested rigorously for safety before being authorized for use in the United States.
- mRNA technology is new, but not unknown. It has been studied for decades.
- mRNA vaccines do not contain live virus and carry no risk of causing disease in the vaccinated person.
- mRNA from the vaccine never enters the nucleus of the cell and does not affect or interact with a person's DNA.

A new approach to vaccines

mRNA vaccines take advantage of the process that cells use to make proteins in order to trigger an immune response and build immunity to SARS-CoV-2, the virus that causes COVID-19. In contrast, most vaccines use weakened or inactivated versions or components of the disease-causing pathogen to stimulate the body's immune response to create antibodies.

Mechanism for Action

mRNA vaccines have strands of messenger RNA inside a special coating. That coating protects the mRNA from enzymes in the body that would otherwise break it down. The coating also helps the mRNA enter the muscle cells near the vaccination site. mRNA vaccines



tell our cells to make a piece of the “spike protein” that is found on the surface of the SARS-CoV-2 virus. Since only part of the protein is made, it does not harm the vaccine recipient, but it is antigenic and thus stimulates the immune system to make antibodies.

After the piece of the spike protein is made, the cell breaks down the mRNA strand and disposes of it using enzymes in the cell. As stated above, the mRNA strand never enters the cell's nucleus or affects the vaccine recipient's genetic material. Knowing this helps you respond to misinformation about how mRNA vaccines alter or modify someone's genetic makeup. Once displayed on the cell surface, the protein or antigen causes the immune system to begin producing antibodies. These antibodies are specific to the SARS-CoV-2 virus spike protein, which means the immune system is ready to protect against future infection.

COVID-19 mRNA vaccines will continue to be rigorously evaluated for safety

These COVID-19 mRNA vaccines went through the same rigorous safety assessment as all vaccines do before the Food and Drug Administration authorizes them for use in the United States. This included large clinical trials and data review by a safety monitoring board. Often, patients are concerned about live vaccines. mRNA vaccines are not live vaccines and do not use an infectious element, so they carry no risk of causing disease in the vaccinated person.



mRNA vaccines are new, but not unknown

Currently, there are no licensed mRNA vaccines in the United States. However, researchers have been studying them for decades. mRNA vaccines have been studied for influenza, Zika, rabies, and cytomegalovirus (CMV). Recent technological advancements in RNA biology and chemistry, as well as delivery systems, have mitigated the challenges of these vaccines and improved their stability and effectiveness.



Beyond vaccines, numerous preclinical and clinical studies have used mRNA to encode cancer antigens to stimulate immune responses targeted at clearing or reducing malignant tumors.