

# UNDERSTANDING HOW COVID-19 VACCINES WORK

To understand how COVID-19 vaccines work, it helps to first look at how our bodies fight infection.

## THE IMMUNE SYSTEM: THE BODY'S DEFENSE AGAINST INFECTION

When germs, like the virus that causes COVID-19, invade our bodies, they attack and multiply. This invasion, called an infection, is what causes illness. Our immune system uses several tools to fight infection.

Blood contains many different kinds of cells, like white or immune cells which fight infection. Different types of white blood cells do this in different ways. Many types of immune response cells are important for fighting initial infections and for helping prevent future infections with the same germ. Macrophages and dendritic cells are white blood cells that swallow up and digest germs and dead or dying cells. They cause inflammation and signal other immune cells to fight off an infection.

Dendritic cells and macrophages help lymphocytes recognize the germ so that they can make antibodies against the new germ to fight infection and memory cells to prevent future infections. B-lymphocytes are defensive white blood cells. They produce antibodies that attack the pieces of the virus left behind by the macrophages. T-lymphocytes are another type of defensive white blood cell. They attack cells in the body that have already been infected.

The first time a person is infected with the virus that causes COVID-19, it can take several days or weeks for their body to make and use all the germ-fighting tools needed to recover from the infection. After the infection, the person's immune system remembers what it learned about how to protect the body against the virus.



## HOW COVID-19 VACCINES WORK

COVID-19 vaccines will help our bodies develop immunity to the virus that causes COVID-19 without us having to get the illness.

Different types of vaccines work in different ways to teach the immune system how to recognize a germ without getting sick and be ready to quickly attack the germ if we are exposed to the germ. It takes about two weeks after completing a vaccine series before your body makes an immune response to protect against infection and illness.

Most COVID-19 vaccines will require multiple doses. People will need all doses in the series to be protected. Additionally, research suggests that getting a booster dose can decrease your risk of infection and severe illness with COVID-19. It is possible that a person could be infected with the virus that causes COVID-19 just before or just after vaccination and then get sick because the vaccine did not have enough time to provide protection or because someone did not get both recommended vaccine doses.

Often times, people will have symptoms like mild fever, tiredness, and body aches after getting a vaccine. These symptoms are normal and signal your body's immune response to the vaccine to help you prevent future infections.

