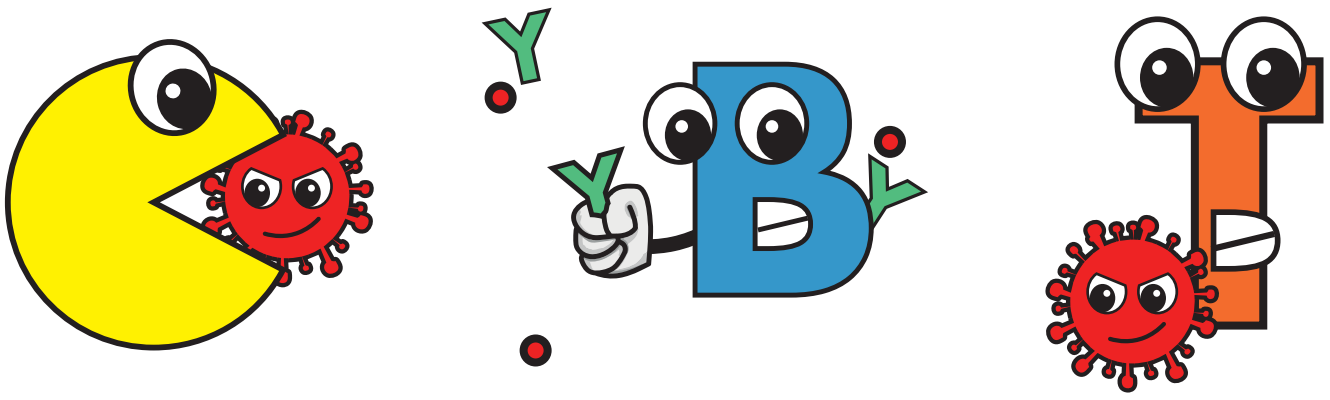
UNDERSTANDING HOW MOST COVID-19 VACCINES WORK

Cheswold Park

The Immune System

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



MACROPHAGES

Macrophages are white blood cells that swallow up and digest viruses and dead or dying cells. The macrophages leave behind parts of the invading germs called **ANTIGENS**. The body identifies antigens as dangerous and stimulates antibodies to attack them.

B CELLS

B-Lymphocytes

B Cells are defensive white blood cells. They produce antibodies that attack the pieces of the virus left behind by the macrophages.

T CELLS

T-Lymphocytes

T Cells 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 get over the infection. After the infection, the person's immune system remembers what it learned about how to protect the body against that disease.

The body keeps a few T Cells, called memory cells, that go into action quickly if the body encounters the same virus again. When the familiar Antigens are detected, B Cells produce antibodies to attack them. Experts are still learning how long these memory cells protect a person against the virus that causes COVID-19.

The BioNTech / Pfizer mRNA Vaccine

mRNA vaccines contain synthetic material similar to that found in the virus that causes COVID-19 that gives our cells instructions for how to make a harmless protein that is unique to the virus. After our cells make copies of the protein, they destroy the genetic material from the vaccine. Our bodies recognize that the protein should not be there and build T Cells and B Cells that will remember how to fight the virus that causes COVID-19 if we are infected. Trials involving 42,000 people found it to be around 90% effective in preventing infection.

*Information taken from https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/how-they-work.html