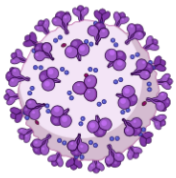
# How do Vaccines Work Against COVID-19?

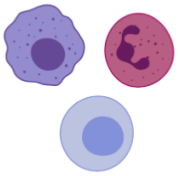
COVID IN LONG-TERM CARE STUDY

## A) The Impact of COVID-19



When SARS-CoV-2 enters our body, it can infect our cells. The virus then uses our cells to make more copies of itself. This virus is very good at infecting lung cells but can also infect cells in other areas of the body. Infection can then lead to cell damage.

## B) The Role of the Immune System



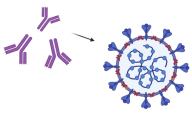
In the first part of our immune response, our immune system detects the virus as 'an invader.' The second part of our immune response then gets activated, this can be called virus specific immunity.

Antibodies are a major component of our 'virus-specific' immune response. They are proteins that have the ability to recognize and bind to **specific** viruses. This prevents the virus from infecting cells and making copies of itself.

One caveat: It takes time for 'virus-specific' antibodies to be produced.

## C) The Importance of Vaccines in Helping our Immune Systems

The mRNA vaccines lead to the production of a small protein that is part of the 'spike protein' which is on the surface of the virus. However, this small protein cannot itself cause infection.



The immune system identifies the spike protein fragment as something that is 'foreign', and virus-specific defenses are activated. This leads to the production of antibodies over a 2-3 week timeframe.

Antibody levels decrease over time after one vaccine, but can be boosted and stay at high levels for longer after a second vaccine (i.e. two doses).

If you are exposed to the virus in the future, your pre-existing antibodies will be able to quickly bind to and prevent the virus from infecting cells and producing more copies of itself.