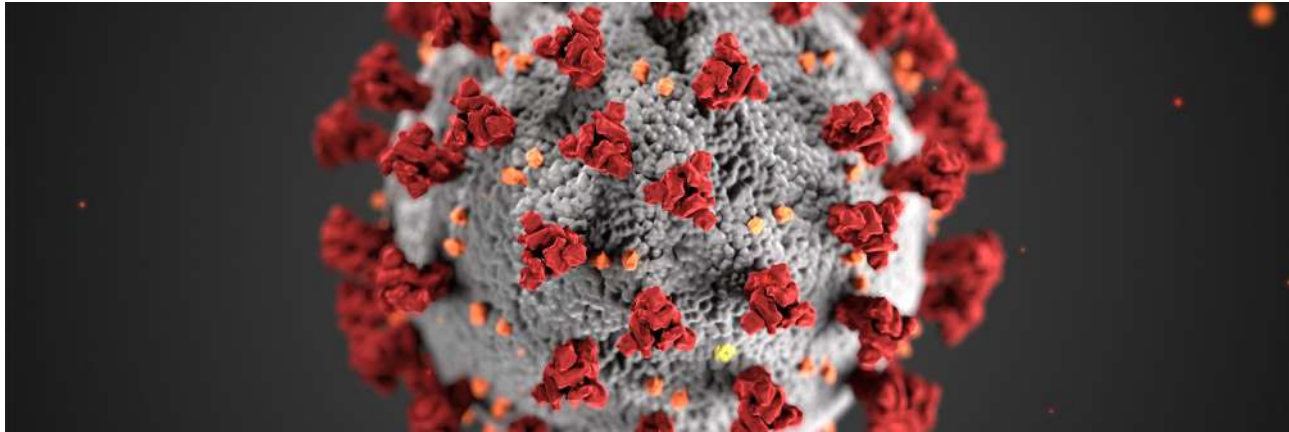


What do you know about vaccines?



Goals

- How do vaccines work
- How are vaccines tested

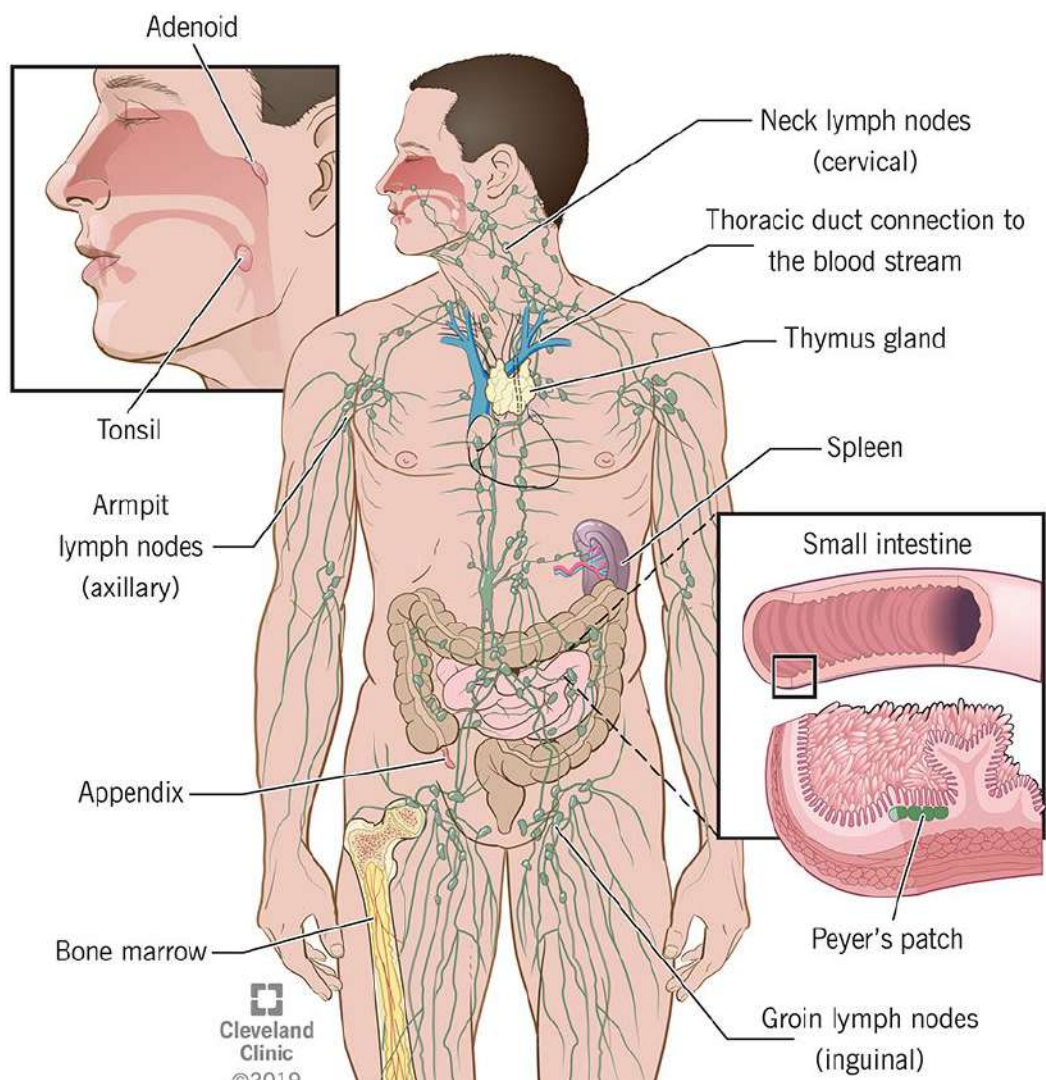
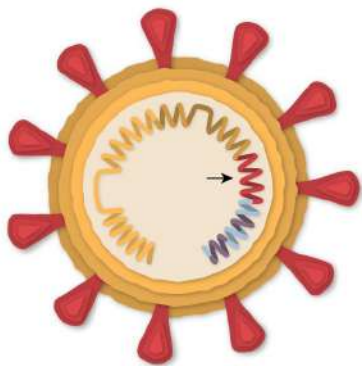
What are Vaccines?

Vaccines train our immune systems to create proteins that fight disease, known as 'antibodies'

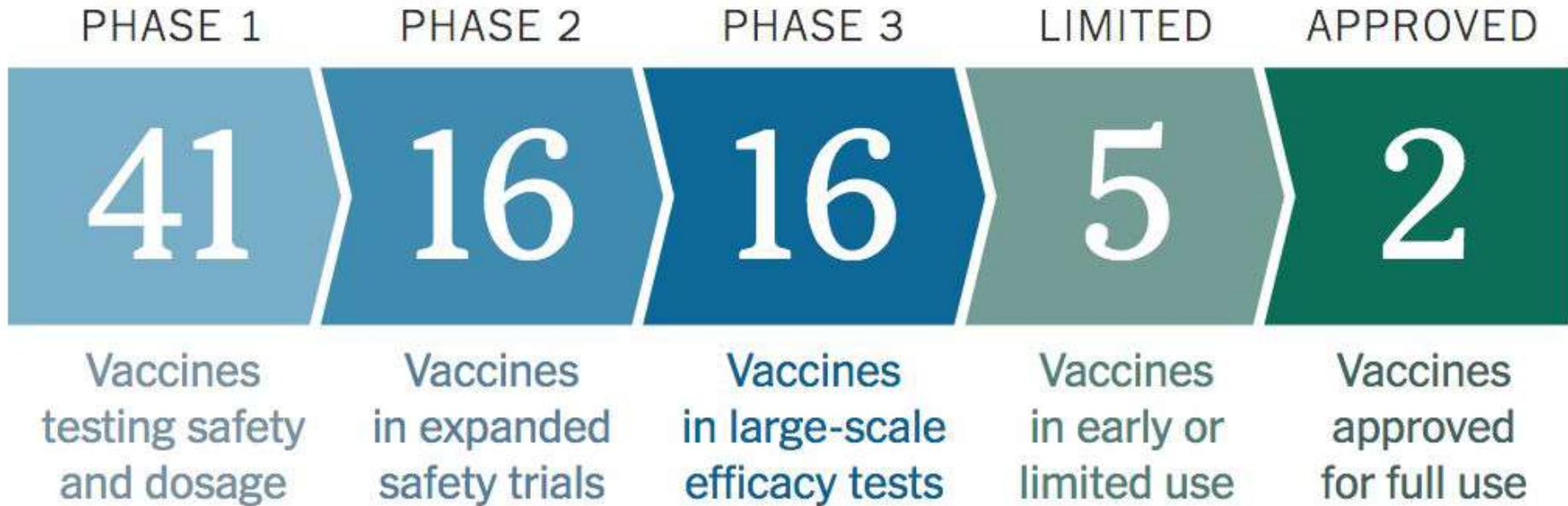
Humans generally create antibodies naturally when exposed to a disease, as our immune systems natural response to fighting viruses.

Vaccines help the immune system build these antibodies before our bodies are exposed to the virus.



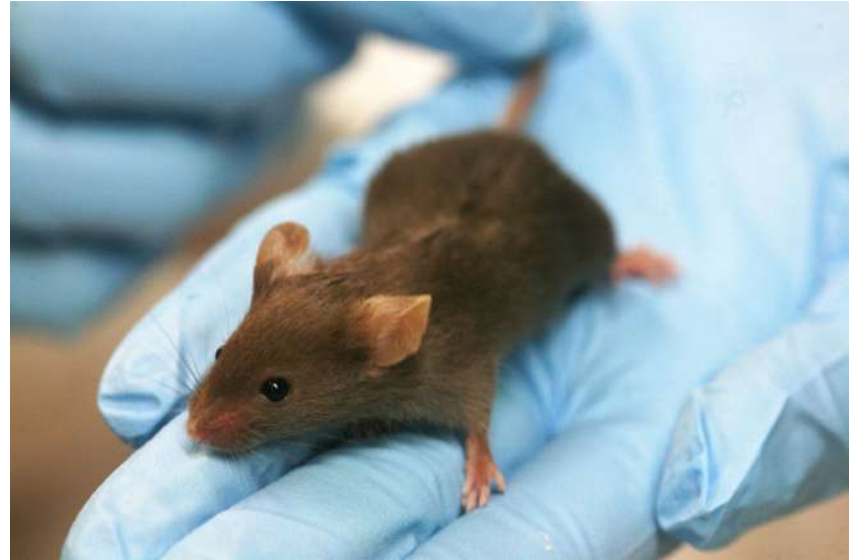
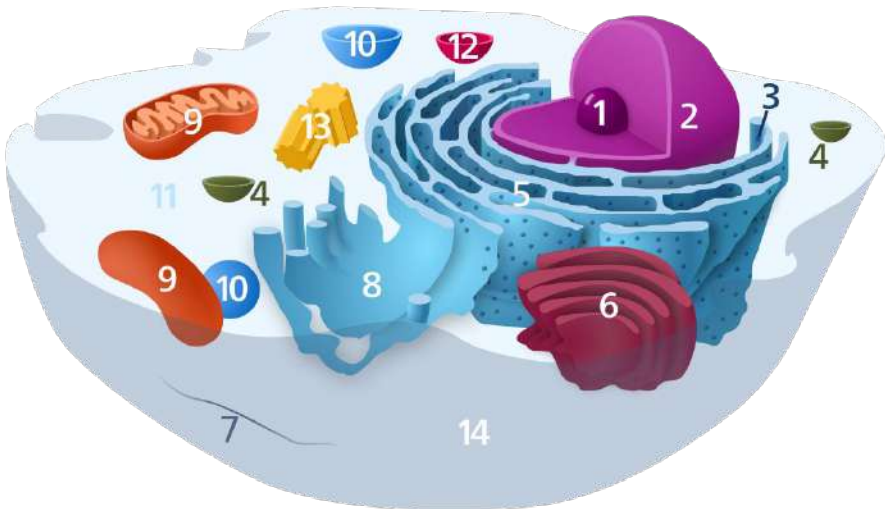


Process of testing vaccines



Pre-Clinical Phase

Scientists test a new vaccine on cells and then give it to animals such as mice or monkeys to see if it produces an immune response.



Phase 1

Scientists give the vaccine to a small number of people to test safety and dosage, as well as to confirm that it stimulates the immune system.

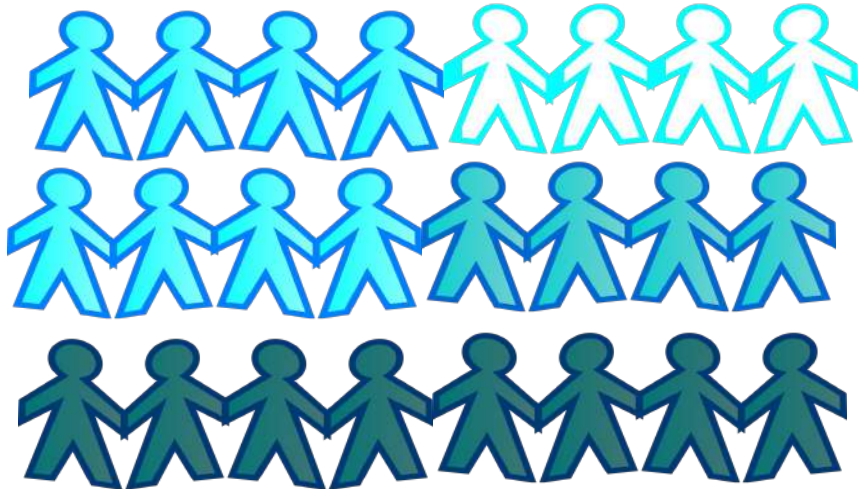
Trial Group



Phase 2

Scientists give the vaccine to hundreds of people split into groups, such as children and the elderly, to see if the vaccine acts differently in them. These trials further test the vaccine's safety.

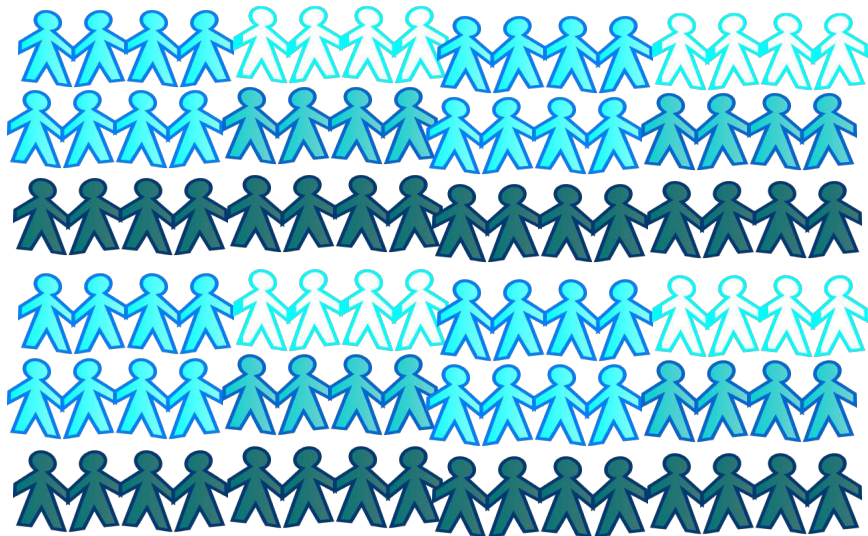
Trial Group



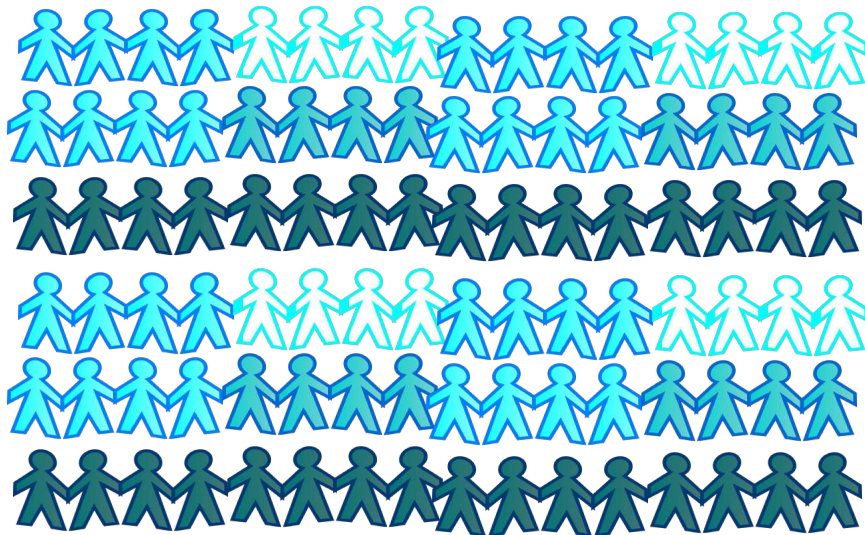
Phase 3

Scientists give the vaccine to thousands of people and wait to see how many become infected, compared with volunteers who received a placebo. These trials can determine if the vaccine protects against the coronavirus, measuring what's known as the [efficacy rate](#). Phase 3 trials are also large enough to reveal evidence of relatively rare side effects.

Trial Group

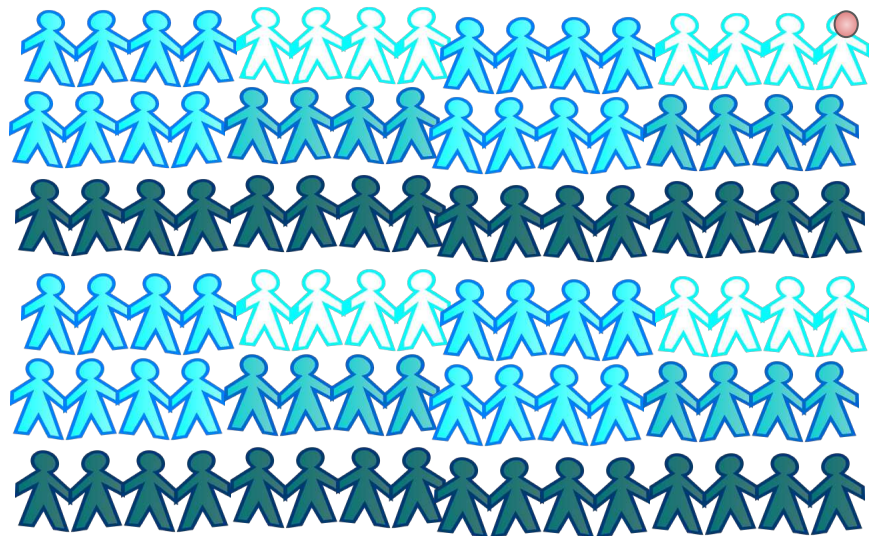


Placebo Group

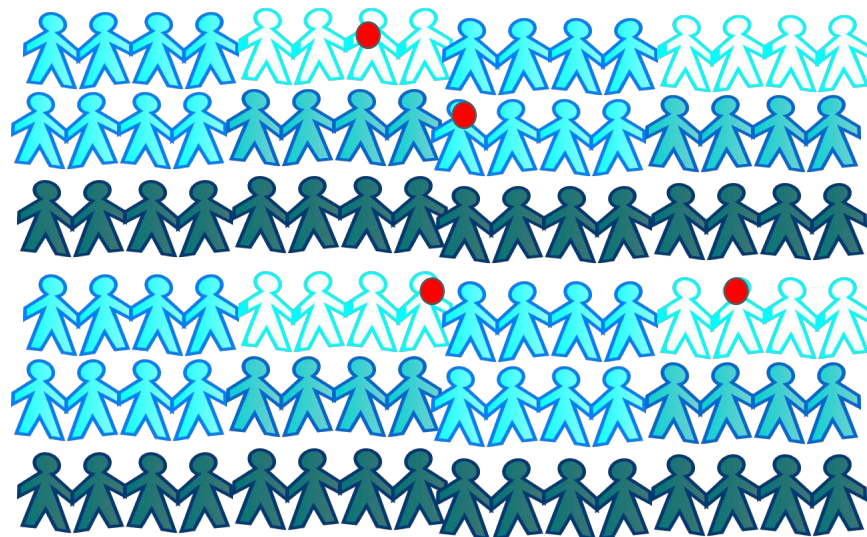


Phase 3

Trial Group



Placebo Group



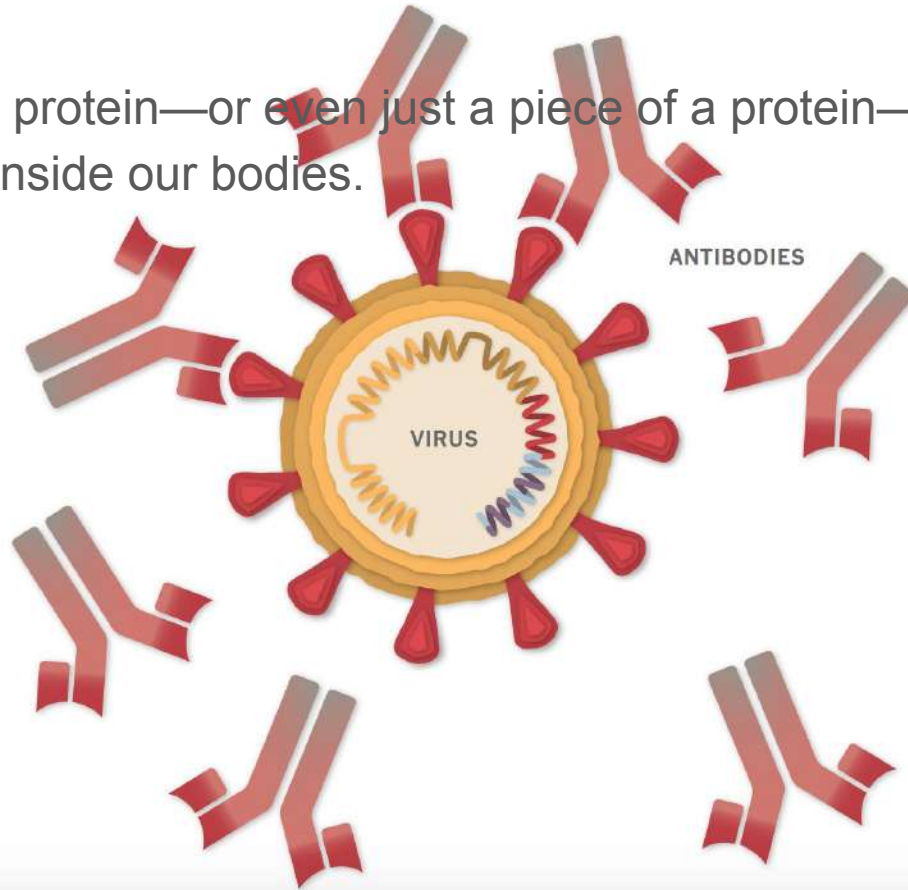
Approval

Regulators review the complete trial results and plans for a vaccine's manufacturing, and decide whether to give it full approval.



mRNA Vaccines

Teach our cells how to make a protein—or even just a piece of a protein—that triggers an immune response inside our bodies.



Moderna's Vaccine

<https://www.nytimes.com/interactive/2020/health/moderna-covid-19-vaccine.html>



Pfizer's Vaccine

<https://www.nytimes.com/interactive/2020/health/pfizer-biontech-covid-19-vaccine.html>



Resources:

New York Times, COVID

World Health Organization

One thing that you already knew

Two things you learned.

Three questions you still have.