

COVID-19 VACCINES

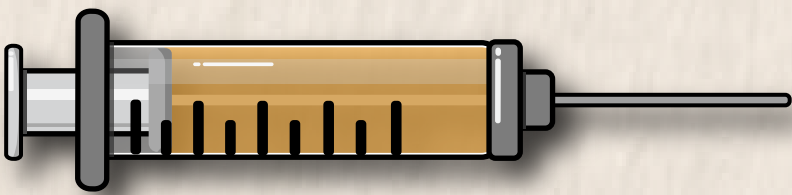
THE SCIENCE BEHIND THEM

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HOW DO VACCINES WORK?

Vaccines stimulate our immune responses to protect against infectious diseases. They prompt our cells to recognize and protect us from antigens (foreign agents) by producing antibodies. Sometimes, the process of building immunity after vaccination can cause symptoms, such as fever. These symptoms are expected.



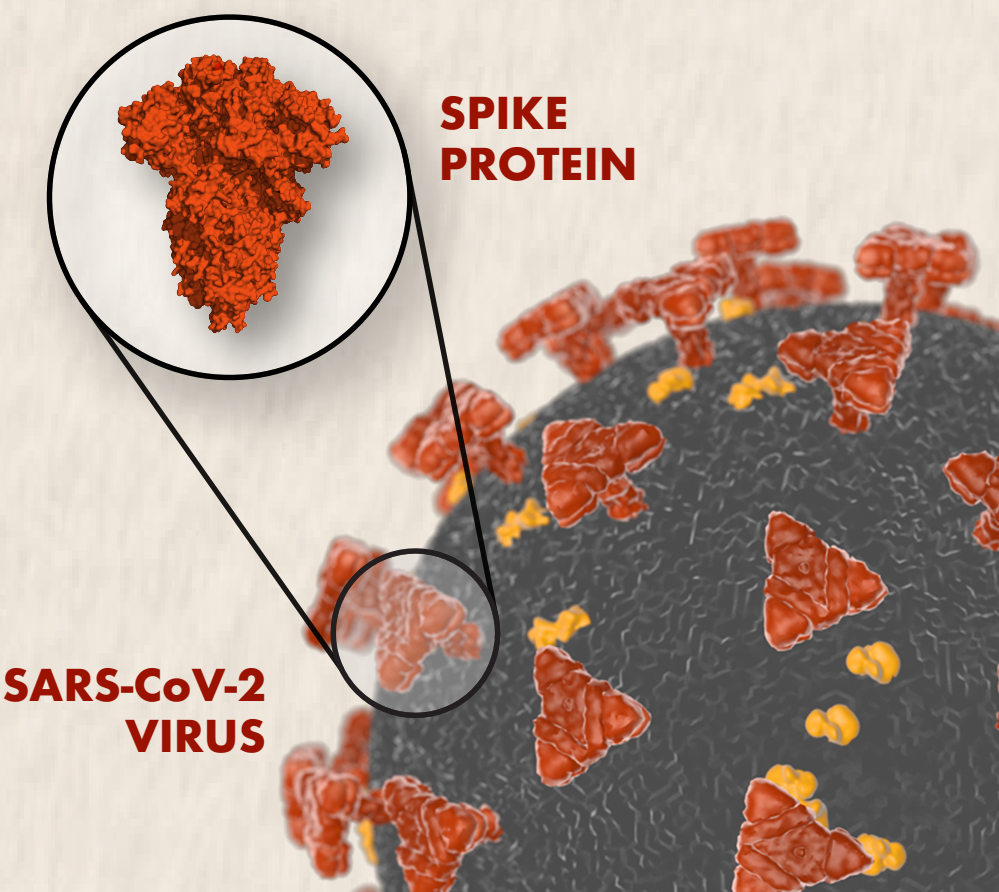
The goal of vaccines is to make our bodies produce protective antibodies.

COVID-19 vaccines expose our immune system to Spike proteins which induce the production of these antibodies.

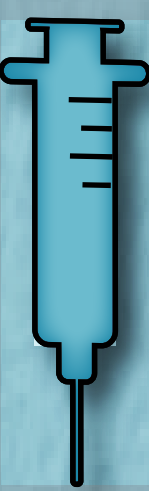
You cannot get COVID-19 from a COVID-19 vaccine.

MAKING A VACCINE: STUDYING PROTEIN STRUCTURES

To fight the COVID-19 outbreak, scientists began by analyzing the structure of the virus' proteins. Visualizing these structures is key to understanding how the virus invades our cells and hides from our defense mechanisms. Scientists have found important proteins that can be used as targets in vaccination, such as the **Spike protein**. This protein is found on the surface of the virus and is necessary for viral entry into human cells.



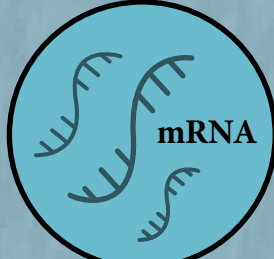
COVID-19 VACCINE TECHNOLOGIES



mRNA VACCINES

mRNA vaccines contain the instructions for our cells to make Spike proteins. They **cannot cause disease**.

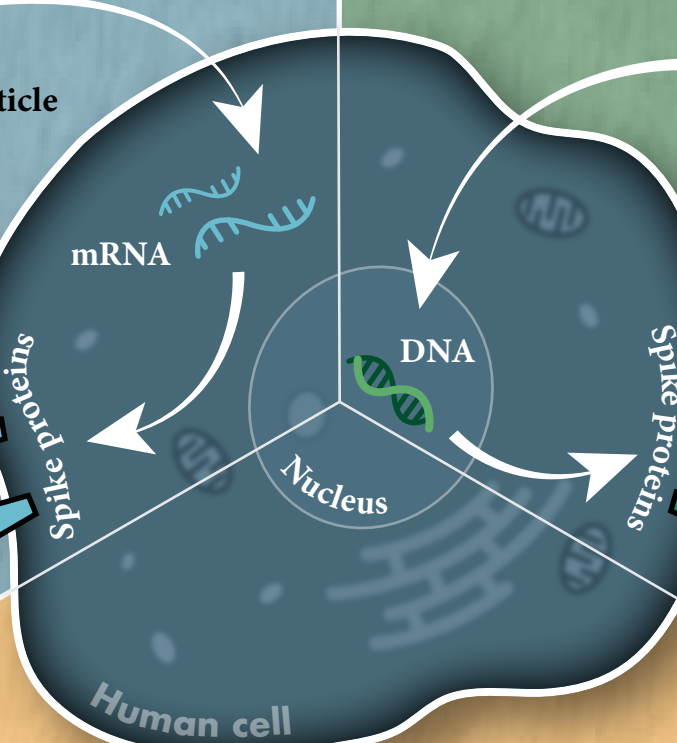
- 1 These instructions are delivered into our cells using lipid nanoparticles. These particles help safeguard the stability of the instructions.



- 2 Our cells read the mRNA instructions and make Spike proteins.



- 3 Our cells display the Spike proteins on their surface so that our antibodies recognize them as antigens. An immune response is then stimulated.



ADENOVIRUS VECTOR VACCINES

The adenovirus vector vaccines transport instructions to our cells to make Spike proteins, working as a vehicle (or viral vector).

- 1 The viral vector carries the Spike protein DNA into our cells' nuclei. These vectors are modified and **cannot cause disease**.



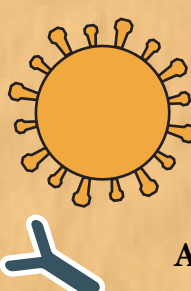
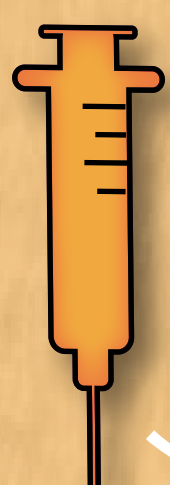
- 2 Our cells read the DNA instructions and make Spike proteins.



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INACTIVATED VIRUS VACCINES

The inactivated COVID-19 vaccines use inactive versions of the SARS-CoV-2 virus that can stimulate our immune system, but **cannot cause disease**.



Antibodies



THE DIFFERENT COVID-19 VACCINES

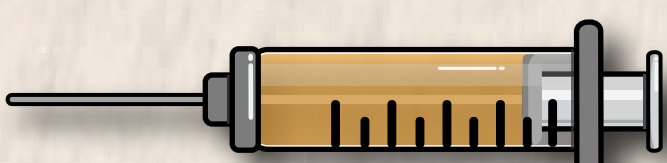
TECHNOLOGY	VACCINE NAME/MAKER	STORAGE	DOSES	EFFICACY * *	EFFICACY vs SEVERE COVID-19
Spike mRNA	Pfizer-BioNTech	-80°C to -60°C	2	95%	≥97%
	Moderna	-20°C		94.1%	100%
Adenovirus vector carrying Spike gene	Sputnik V * (Gamaleya National Center)	2°C to 8°C	2	91.6%	100%
	AstraZeneca-Oxford (also Covishield)			63.09% - 90%	100%
	Janssen * (Johnson & Johnson)		1	67 - 85%	≥85%
	Convidecia * (CanSinoBIO)			65.7%	≥90%
Inactivated virus	CoronaVac * (Sinovac)	2°C to 8°C	2	50.4 - 65.3%	Pending

* Final clinical review by WHO in progress as of March 17, 2021.

** Efficacy defined as the prevention of symptomatic disease for fully vaccinated individuals.

WHICH VACCINE SHOULD I GET?

THE BEST COVID-19 VACCINE IS THE ONE THAT'S AVAILABLE TO YOU.



All approved vaccines are safe and effective. Moreover, no individual has died of COVID-19 after completing their vaccination schedule. **When it is your turn, get the vaccine!** You are not only protecting yourself, but everyone around you.

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For more information on the science behind COVID-19, visit **SciForAll.org**

