

# mRNA COVID-19 VACCINES AND YOUR IMMUNE SYSTEM

## How does the virus that causes COVID-19 infect a person?

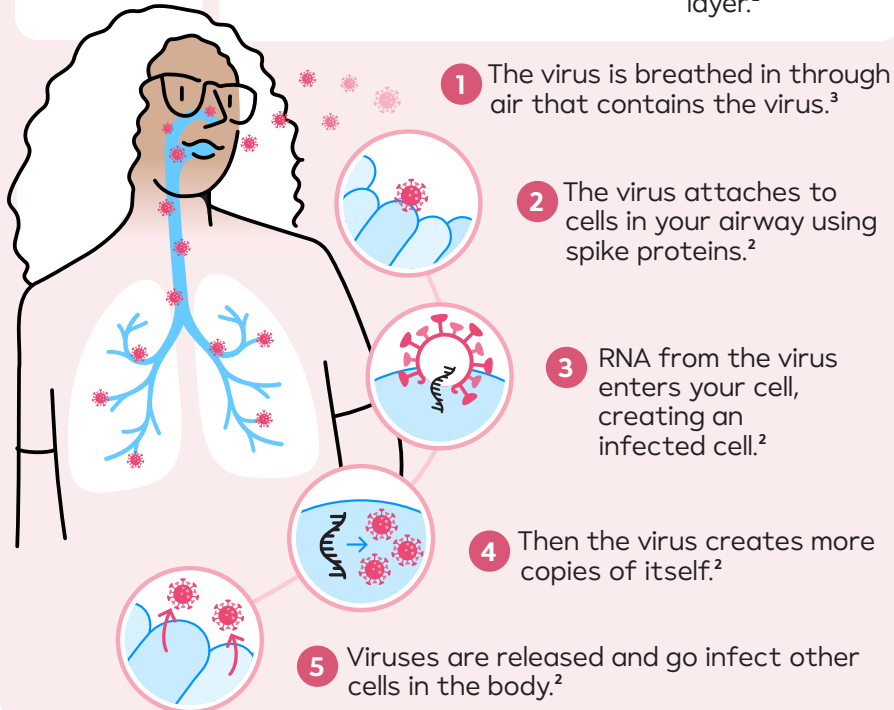
SARS-CoV-2 is the virus that causes COVID-19.<sup>1</sup>

### SARS-CoV-2 Virus Structure:



**RNA:** Carries the genetic information for the virus.<sup>2</sup>

**Spike protein:** A fatty layer (lipids) protects viral RNA. Spike proteins are on the fatty layer.<sup>2</sup>

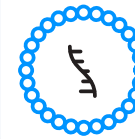


## How do mRNA COVID-19 vaccines work?

mRNA COVID-19 vaccines **train your immune system to recognize and help fight against the COVID-19 virus.**<sup>4</sup>

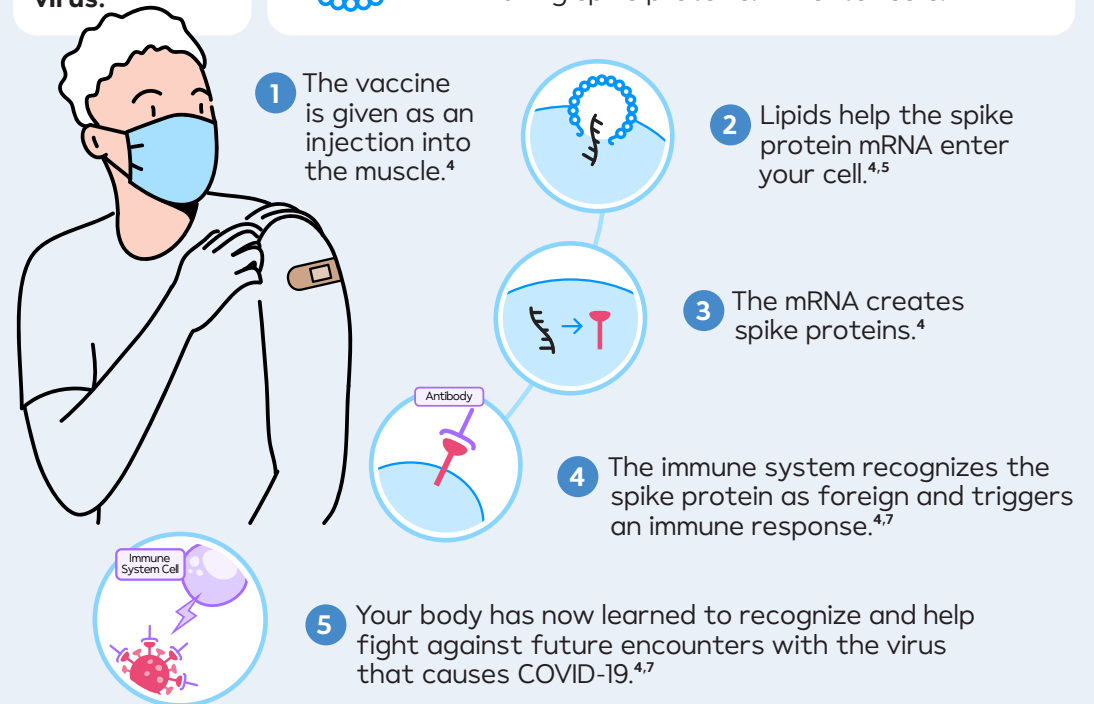
### Vaccine Structure:

The vaccine cannot give you COVID-19. The vaccine does not contain the live virus that causes COVID-19. **The mRNA vaccine ingredients include:**<sup>4,5</sup>



**Spike protein mRNA:** mRNA that has instructions for making spike proteins.<sup>5</sup>

**Lipids (fat):** Protect vaccine RNA and help mRNA enter cells.<sup>5,6</sup>



Visit [covid19pfizer.com](https://covid19pfizer.com) to receive information on COVID-19 and a vaccine option from Pfizer and BioNTech, and to learn how you can help protect yourself and those you take care of.

To learn more, visit: **References:** 1. CDC. About COVID-19. Updated July 2023. Accessed October 2023. <https://www.cdc.gov/coronavirus/2019-ncov/your-health/about-covid-19.html> 2. Jackson C, Farzan M, Chen B, Choe H. Mechanisms of SARS-CoV-2 entry into cells. *Nat Rev Mol Cell Biol.* 2022;23:3–20. doi: 10.1038/s41580-021-00418-x 3. EPA. Indoor Air and Coronavirus (COVID-19). Updated June 2023. Accessed October 2023. <https://www.epa.gov/coronavirus/indoor-air-and-coronavirus-covid-19> 4. CDC. Understanding How COVID-19 Vaccines Work. Updated September 2023. Accessed October 2023. <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/how-they-work.html> 5. CDC. Overview of COVID-19 Vaccines. Updated September 2023. Accessed October 2023. <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/overview-covid-19-vaccines.html> 6. Hald Albertsen C, Kulkarni JA, Witzigmann D, Lind M, Petersson K, Simonsen JB. The role of lipid components in lipid nanoparticles for vaccines and gene therapy. *Adv Drug Deliv Rev.* 2022;188:114416. doi: 10.1016/j.addr.2022.114416 7. MedlinePlus. What are mRNA vaccines and how do they work? Updated November 2022. Accessed October 2023. <https://medlineplus.gov/genetics/understanding/therapy/mrnnavaccines/>