EMGUIDANCE

The Pfizer-BioNTech COVID-19 vaccine

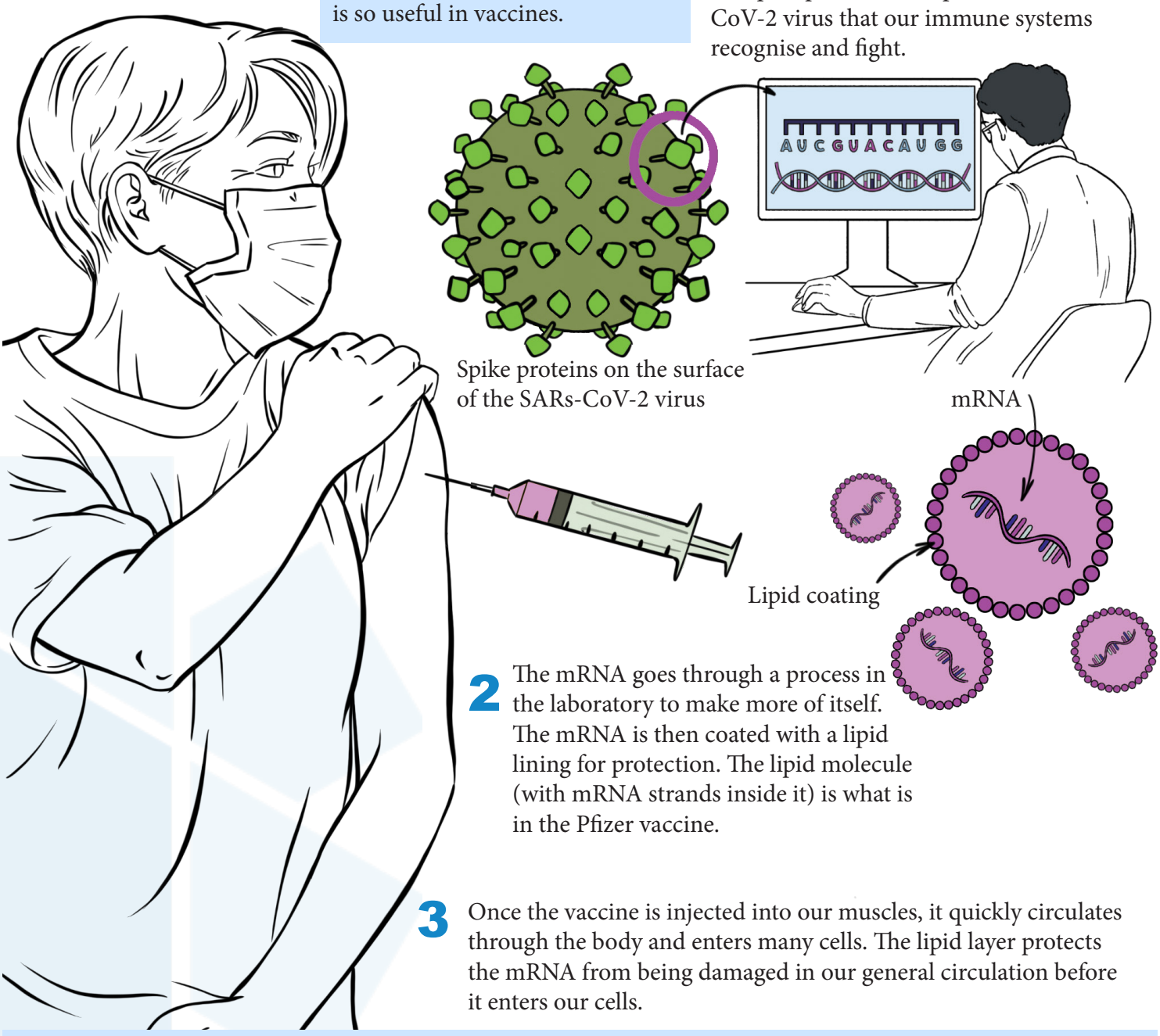
How is it made and how does it work?

The Pfizer vaccine is an mRNA vaccine.

Did you know? SARs-CoV-2 is the coronavirus that causes the illness COVID-19.

Did you know? The spike protein on the virus cannot make us sick by itself, but it is still the part of the virus that our immune system recognises and fights. That's why it is so useful in vaccines.

1 Scientists can read and identify different parts of the genetic code of the SARS-CoV-2 virus. By isolating and copying parts of this code, they create something called messenger RNA or mRNA – a set of genetic instructions that tells our body cells how to make a copy of the SARS-CoV-2 virus's spike protein. This is helpful because the spike protein is the part of the SARS-CoV-2 virus that our immune systems recognise and fight.

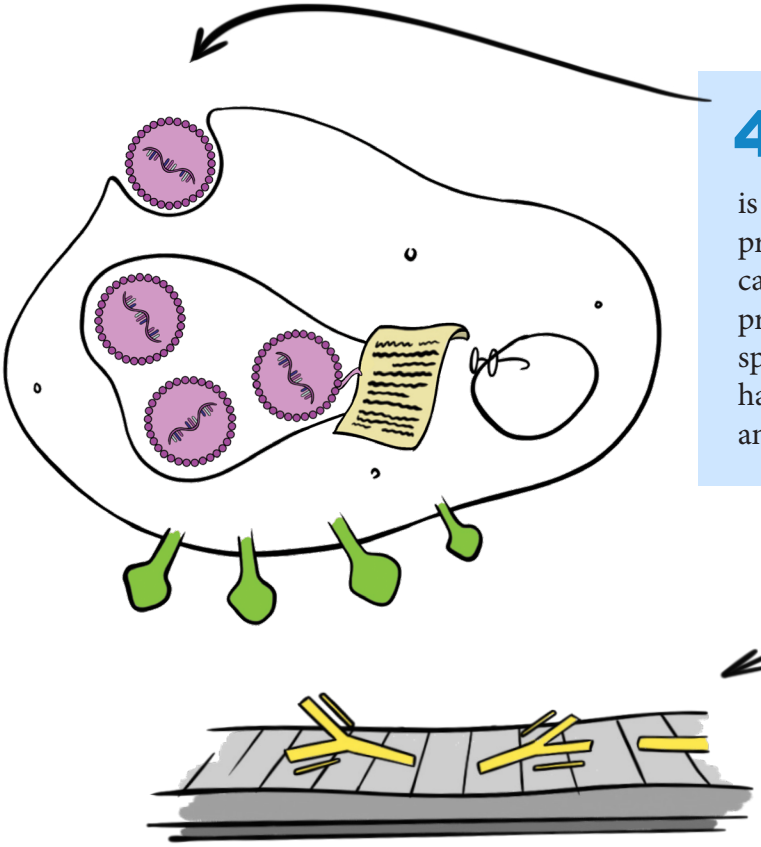


2 The mRNA goes through a process in the laboratory to make more of itself. The mRNA is then coated with a lipid lining for protection. The lipid molecule (with mRNA strands inside it) is what is in the Pfizer vaccine.

3 Once the vaccine is injected into our muscles, it quickly circulates through the body and enters many cells. The lipid layer protects the mRNA from being damaged in our general circulation before it enters our cells.

Did you know? Messenger RNA, or mRNA, is a piece of genetic code that tells your body how to make a specific protein.

Inside the human body

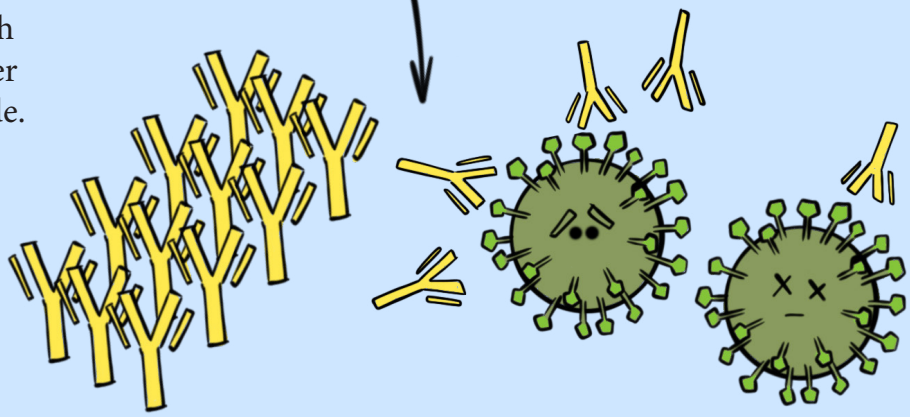


4 When the lipid molecule enters our cells, the lipid is broken down and the mRNA is released. Because our cells are always making proteins as part of our usual bodily functions, they can 'read' the mRNA and make copies of the spike protein found in the SARS-CoV-2 virus. These new spike proteins can't make us sick because they don't have the rest of the SARS-CoV-2 virus with them and they only last a short time.

5 Our cells then 'present' these spike proteins to the immune system. Our immune system recognises the spike proteins as being part of a virus so it produces antibodies and memory cells to fight the virus. We now have an army ready to fight the actual SARS-CoV-2 virus if it ever enters our bodies! We'll be able to fight it quickly and effectively so we don't get COVID-19 or only get it mildly.

6 The mRNA are destroyed through a natural bodily process soon after the spike proteins have been made.

7 We don't know yet how long this army will last, but the memory cells may remember how to make it for years or even decades after the vaccination.



FAQ:

Is it safe?

So far the safety of the Pfizer COVID-19 vaccine has been excellent. Safety was very carefully evaluated during the initial clinical trials in more than 40 000 people. Since then, millions of people around the world have had the Pfizer vaccine and careful and very detailed safety monitoring has been put in place to monitor side effects. In fact, COVID-19 vaccines have had more safety monitoring put in place than any other vaccine in history.

Is it effective?

People who have had 2 Pfizer vaccines had 95% less chance of being infected by the original COVID-19 variant than someone who had not been vaccinated.

As more variants have spread across the world, many people are concerned about whether the vaccines still work. All data to date suggests that the Pfizer vaccine still effectively protects against all currently known COVID-19 variants.

It may still be possible to get COVID-19 if you have been vaccinated (especially if you have only had 1 dose), but you are extremely unlikely to get severe COVID-19 or to end up in hospital or die from it.

Does it have side effects?

Results from vaccine safety monitoring efforts are reassuring. Some people have no side effects.

The side effects most frequently reported are those common to many vaccines and are a result of the immune system responding to the vaccine. They include pain, redness or swelling at the site of the injection and tiredness, headache, muscle pain, chills, fever or nausea. These side effects are usually mild and last 24 to 48 hours.

Like with many vaccines, there is a very small risk of a severe allergic reaction (2 to 5 people per 1 million doses). This is why you're asked to wait for 15 minutes after having your vaccination: if you do have this reaction, the healthcare staff can help you.

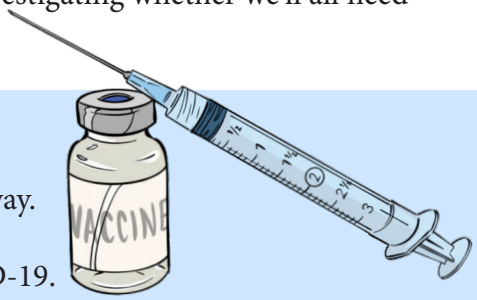
A possible extremely rare side effect that is currently being investigated is heart inflammation. Most cases have been mild and easily treated and have been in men aged 16 to 19. If you experience any of the following after your vaccination, contact your doctor immediately: chest pain, shortness of breath or feelings of having a fast-beating, fluttering or pounding heart.

How many doses will I need?

The Pfizer-BioNTech vaccine requires 2 injections, given 21 to 42 days apart. For the vaccine to work well, it's very important to have both doses.

How long will my immunity last?

We don't yet know how long protection lasts for those who are vaccinated. Experts are working to learn more about both natural immunity and vaccine-induced immunity. However, based on tracking whether vaccinated people came down with COVID-19 or not, both Pfizer and Moderna have reported that their vaccines provide at least 6 months of protection. Scientists are currently investigating whether we'll all need booster injections, which are quite common for vaccines.



Will it change my DNA?

No. COVID-19 vaccines do not change or interact with your DNA in any way. As explained above, mRNA vaccines deliver instructions (genetic material) to our cells to start building protection against the virus that causes COVID-19. However, the genetic material never enters the nucleus of the cell, which is where our DNA is kept. The mRNA is destroyed naturally by the body shortly after it has entered our cells and done its job.

Does it leave any DNA or DNA instructions in my body?

Vaccines using mRNA do not permanently stay in a recipient's body or alter DNA.

Why is the vaccine given into the muscles in my arm?

Injecting into muscles is safer and easier than injecting into veins. The vaccine enters the muscle cells and some surrounding cells, where it starts to do its work.

If the vaccine was injected into our skin instead, it could be destroyed before it reached the right body cells. Similarly, if we were to take it orally, it would be destroyed in the digestive system.

References available on request.