

WHAT I NEED TO KNOW ABOUT THE PFIZER-BIONTECH COVID-19 VACCINE

This document is designed by Nikita Gupta

Student of National University of Singapore, Majoring in Life Sciences (specialisation in Biomedical Science)

Disclaimer: This document has been created using material available about the vaccine from resources on Page 11. Information is subject to change with time as more data from research is gathered.





BASIC INFORMATION ABOUT VACCINE

 This vaccine has been jointly developed by Pfizer and BioNTech

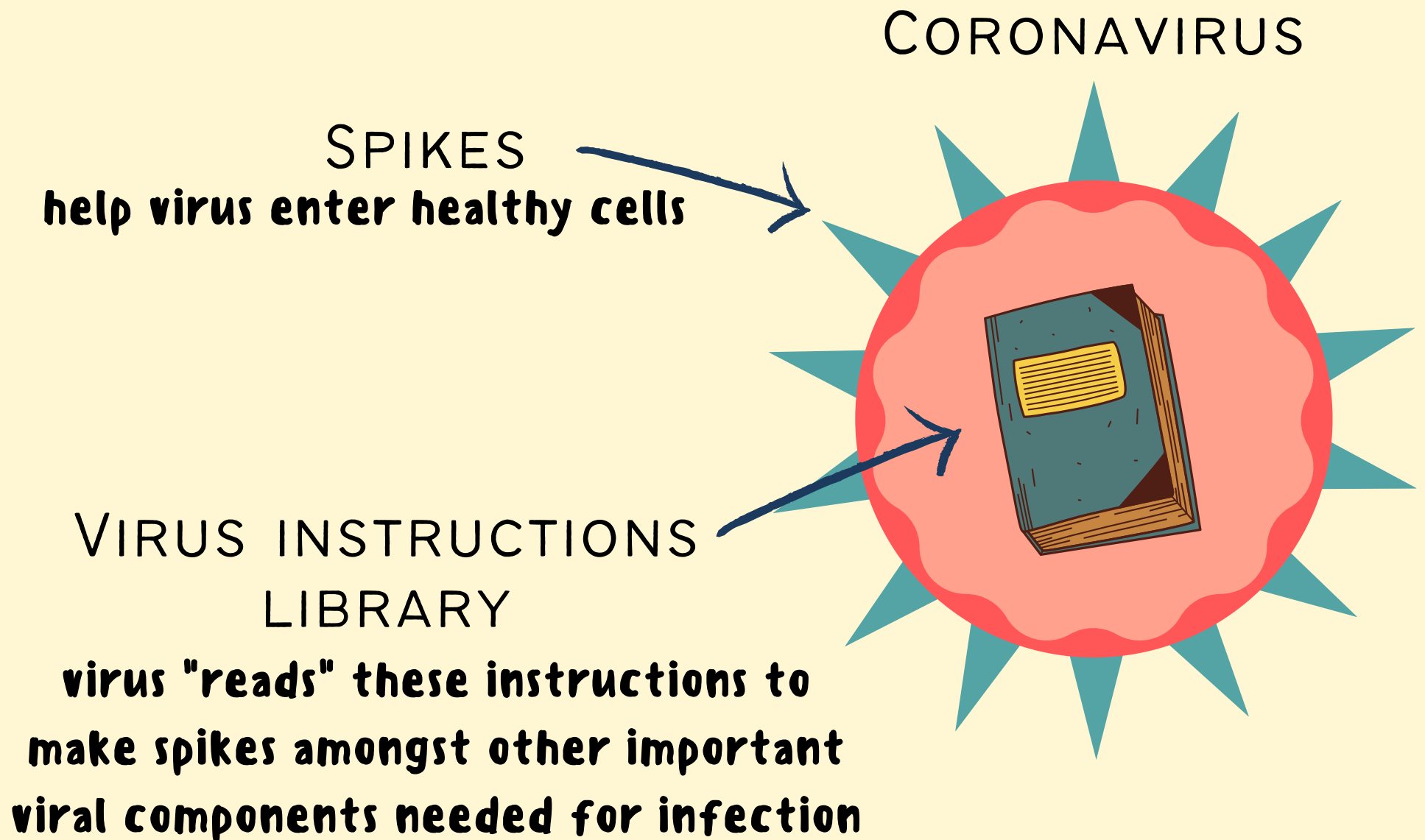
 Brand name: COMIRNATY

<https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-supply-european-union-100-million>

 Efficacy rate of 95% in preventing COVID-19 based on data from clinical trials

 **not curing!**

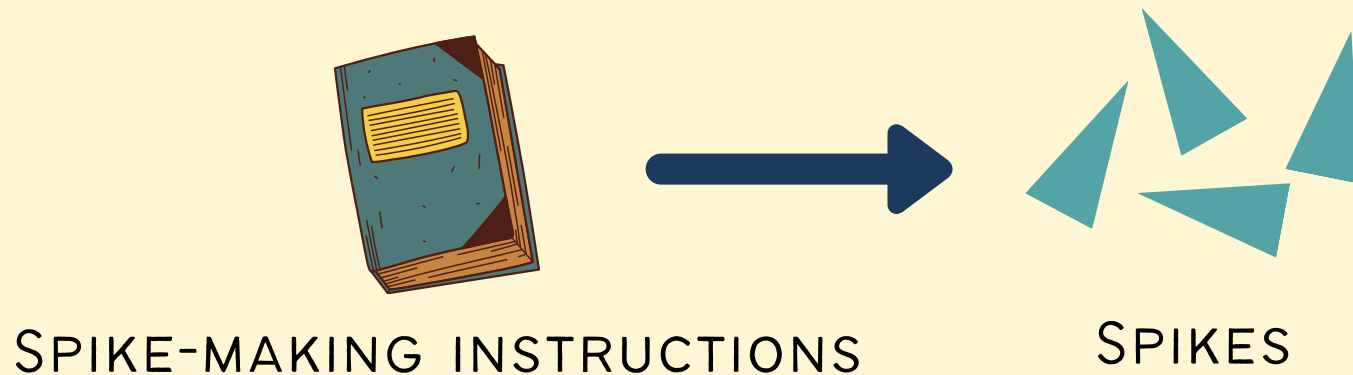
OVERVIEW OF CORONAVIRUS




HOW DOES THE VACCINE WORK?



(part 1)

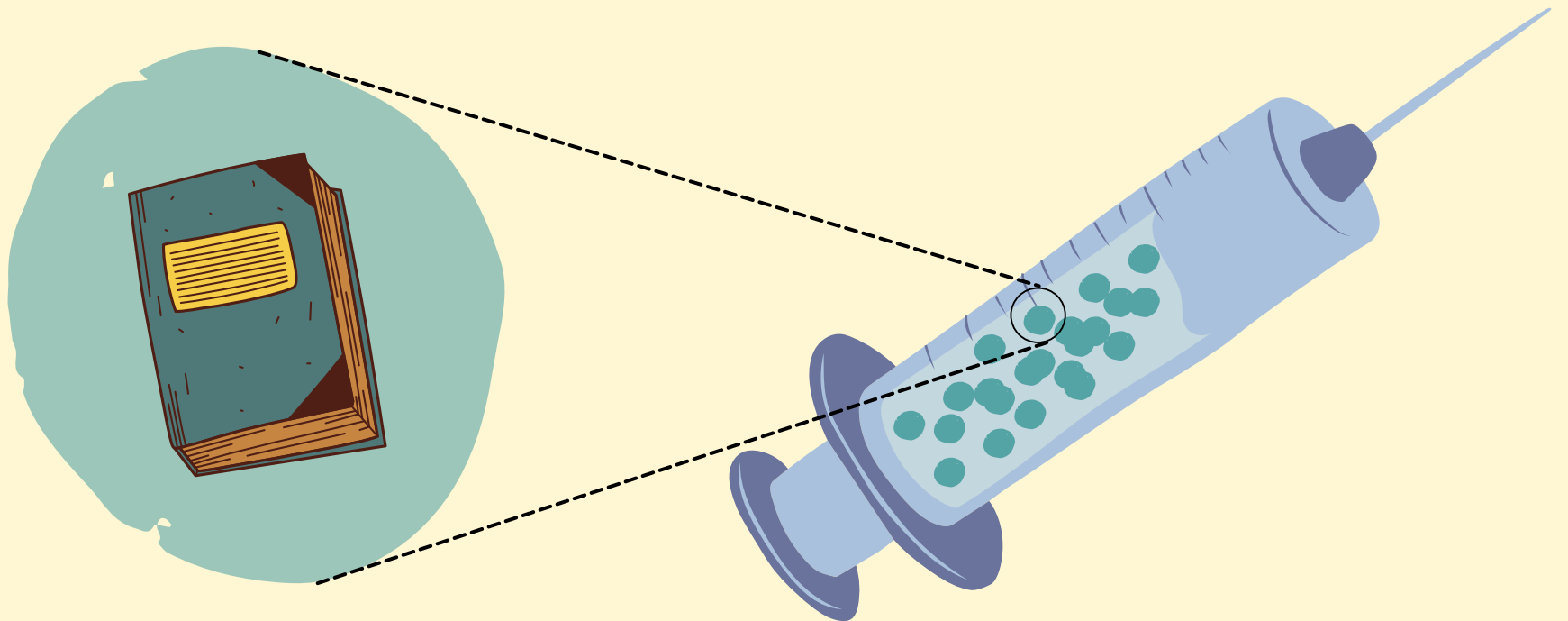
 Vaccine contains **spike-making instructions, known as spike mRNA**, which our cells will "read" in order to make spikes



 These spikes on our healthy cells will help to **stimulate our immune system and prepare it for a potential infection**

HOW DOES THE VACCINE WORK? (part 2)

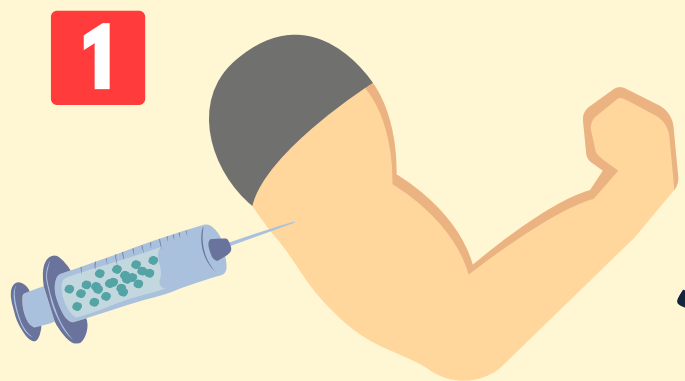
-  mRNA cannot be injected directly as it will be destroyed by our body
-  mRNA has to be re-packaged into an oily bubble



OILY BUBBLE CONTAINING
SPIKE-MAKING INSTRUCTIONS
(SPIKE MRNA)

HOW DOES THE VACCINE WORK?

(part 3)

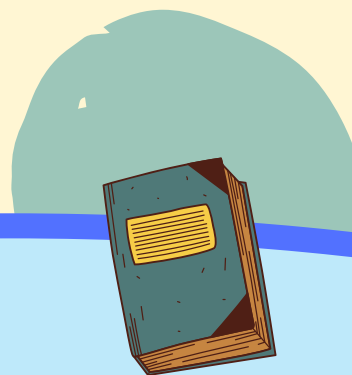


INJECTION IN DELTOID
MUSCLE OF ARM



2

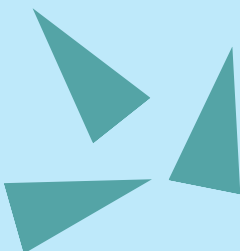
BUBBLE FUSES WITH A HEALTHY
CELL AND RELEASES SPIKE-
MAKING INSTRUCTIONS



3



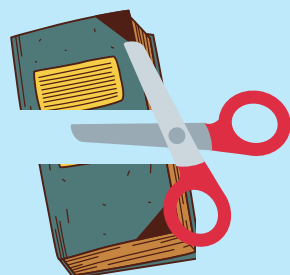
CELL READS INSTRUCTIONS AND
BUILDS SPIKES



4

SPIKES MIGRATE TO CELL
SURFACE AND CAN BE
RECOGNISED BY IMMUNE
SYSTEM

5



SPIKE-MAKING INSTRUCTIONS FROM
VACCINE ARE EVENTUALLY DESTROYED BY
CELL TO LEAVE NO PERMANENT TRACE

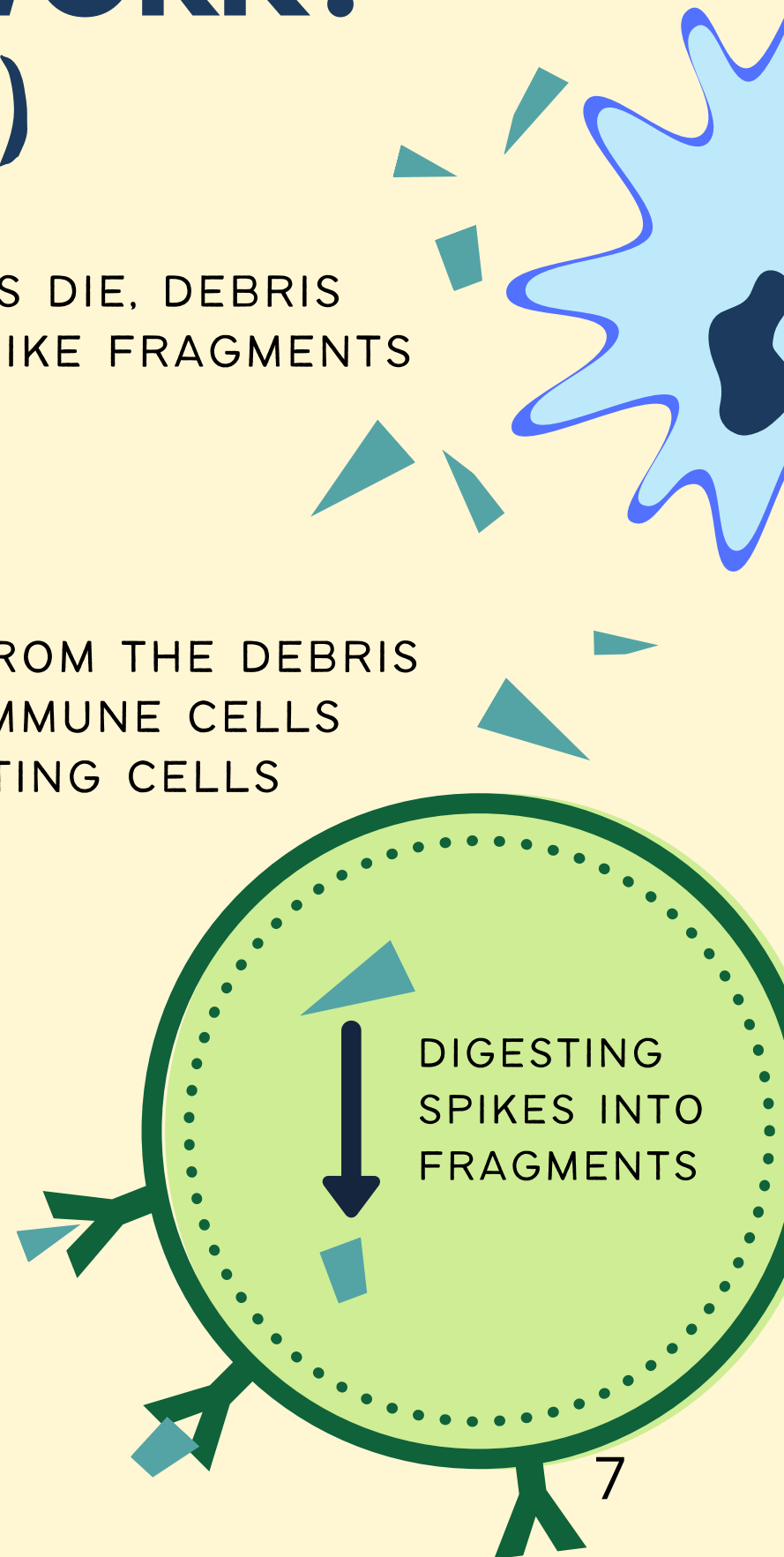
HOW DOES THE VACCINE WORK?

(part 4)

6 WHEN VACCINATED CELLS DIE, DEBRIS WILL CONTAIN SPIKES/SPIKE FRAGMENTS

7 THESE SPIKES/FRAGMENTS FROM THE DEBRIS ARE TAKEN UP BY SPECIAL IMMUNE CELLS KNOWN AS ANTIGEN-PRESENTING CELLS

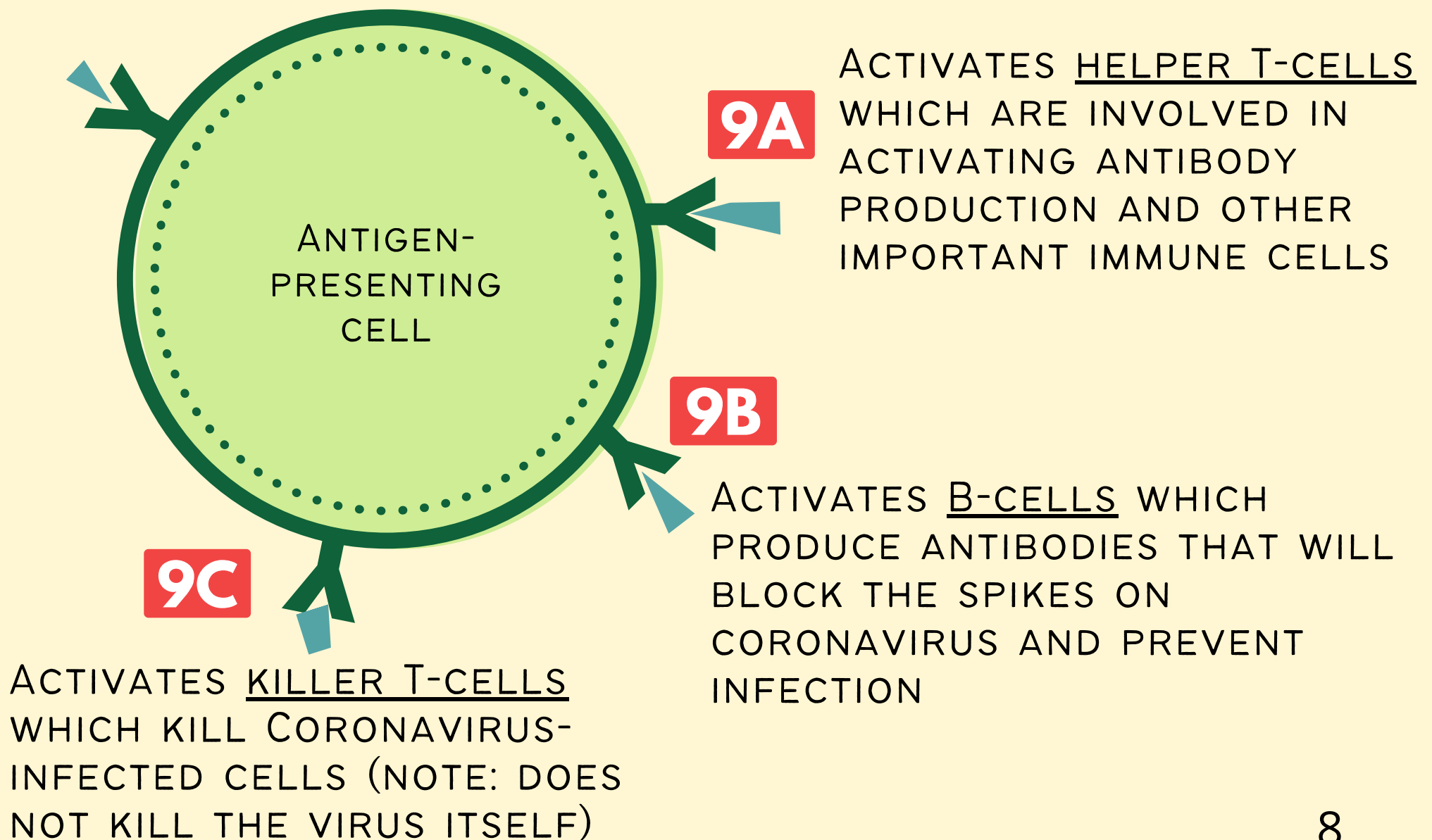
8 THESE SPECIAL CELLS PRESENT FRAGMENTS OF THE SPIKES ON THEIR SURFACE



HOW DOES THE VACCINE WORK?

(part 5)

9 SPIKE FRAGMENTS ON ANTIGEN-PRESENTING CELLS ACTIVATE 3 MAIN TYPES OF IMMUNE CELLS



SO EVEN IF I GET INFECTED AFTER TAKING THE VACCINE...

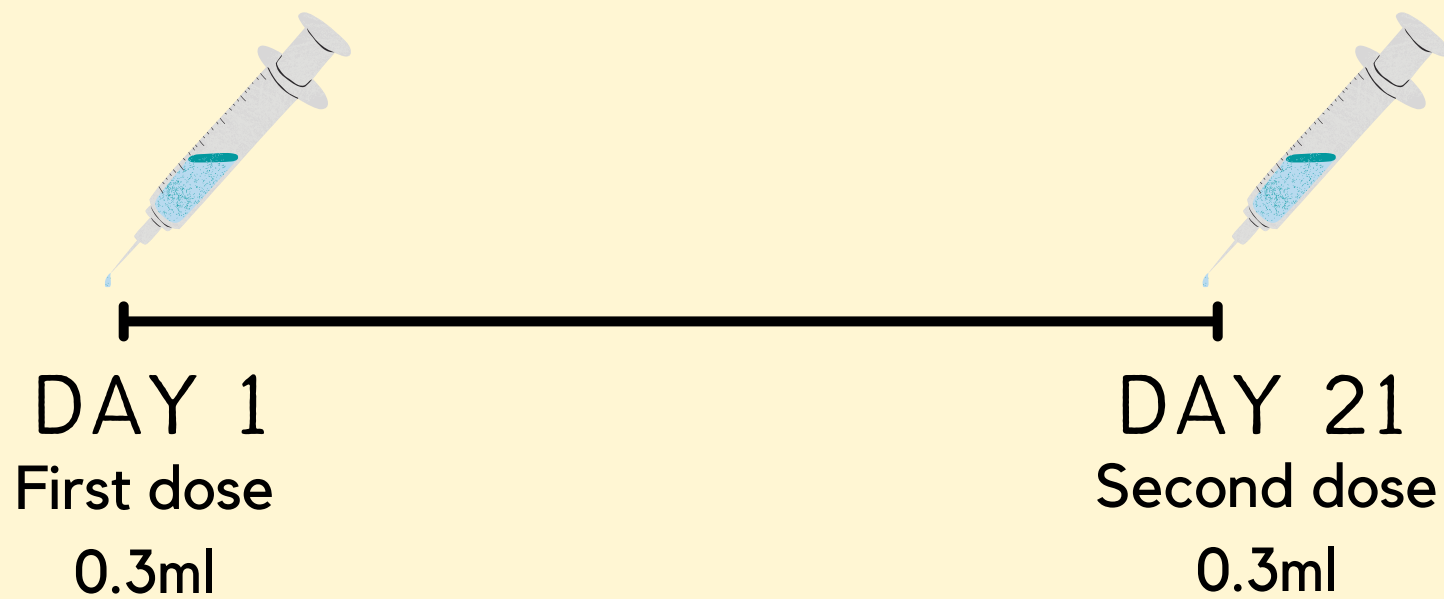
I will have a large army of

- Helper T-cells
- Antibody- producing B-cells
- Killer T-cells

ready and primed to fight against the Coronavirus



DOSING INFORMATION



- **2 doses** to achieve best possible immunity against Coronavirus
- Doses separated by **at least 21 days**
- Recipients to be **16 years and above**

HELPFUL RESOURCES

- [Polack, F. P., Thomas, S. J., Kitchin, N., Absalon, J., Gurtman, A., Lockhart, S., Gruber, W. C. \(2020\). Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. New England Journal of Medicine. doi:10.1056/nejmoa2034577](#)



- https://www.hsa.gov.sg/docs/default-source/hprg-tpb/guidances/pfizer-biontech-vaccine_factsheet-and-pi-for-hcp.pdf



- <https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/pfizer-biontech-covid-19-vaccine>



- <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/Pfizer-BioNTech.html>



DEBUNKING COMMON MYTHS

COVID-19 vaccines are rushed and are not safe



DUE TO THE PRESSING NEED TO CURB THE PANDEMIC, SIGNIFICANT AMOUNT OF RESOURCES HAVE BEEN INVESTED IN DEVELOPING A VACCINE. THIS ALLOWED THE PROCESS TO BE ACCELERATED WITHOUT COMPROMISING SAFETY! THE SAME STEPS WERE TAKEN BUT PROCESSES WERE STREAMLINED TO QUICKEN THE PROCESS.

The vaccine will give me COVID-19



THIS IS FALSE AS MRNA VACCINES DO NOT CONTAIN ANY VIRUS. INSTEAD, THE VACCINE CONTAINS INSTRUCTIONS FOR MAKING A HARMLESS PIECE OF JUST ONE OF THE MANY PROTEINS THE CORONAVIRUS NEEDS FOR SUCCESSFUL INFECTION. YOUR BODY WILL DESTROY THESE INSTRUCTIONS ONCE THE SPIKE PROTEINS ARE MADE.

DEBUNKING COMMON MYTHS

If I have had COVID-19, I won't have to get the vaccine because I am already immune



THERE IS NOT ENOUGH INFORMATION TO SAFELY SAY IF OR FOR HOW LONG AFTER INFECTION SOMEONE IS PROTECTED FROM GETTING COVID-19 AGAIN. MORE STUDIES ARE NEEDED TO BETTER UNDERSTAND THIS.

The vaccine will alter my DNA



THIS IS FALSE SINCE MRNA VACCINES WORK BY INSTRUCTING CELLS IN OUR BODY ON HOW TO MAKE A PROTEIN THAT WILL TRIGGER AN IMMUNE RESPONSE. MRNA DOES NOT ENTER THE NUCLEUS OF CELLS WHICH IS WHERE OUR DNA IS AND HENCE, IT WILL NOT INTERACT WITH OUR DNA.

DEBUNKING COMMON MYTHS

Since COVID-19 survival rate is high, I don't need a vaccine



IT IS TRUE THAT MOST PATIENTS RECOVER FROM THE VIRUS BUT SOME DO EXPERIENCE SEVERE COMPLICATIONS TO VITAL ORGANS. ADDITIONALLY, WIDESPREAD VACCINATION NOT ONLY PROTECTS YOU BUT THE PEOPLE AROUND YOU, SOME OF WHOM MAY BE AT HIGHER RISK OF INFECTION,

Once I get the vaccine, I don't need to practice social distancing or wear a mask



THIS IS FALSE DUE TO 2 REASONS:

1. THIS VACCINE REQUIRES 2 DOSES TO ACHIEVE BEST POSSIBLE IMMUNITY. EVEN AFTER THE SECOND SHOT, YOU DO NOT BECOME IMMUNE IMMEDIATELY. IT TAKES TIME AFTER VACCINATION TO BUILD THE ARMY OF CELLS AND ANTIBODIES TO FIGHT THE VIRUS.
2. IT IS STILL NOT CLEAR IF YOU CAN BE AN ASYMPTOMATIC CARRIER OF THE VIRUS AND PASS IT TO OTHERS EVEN AFTER VACCINATION.

DEBUNKING COMMON MYTHS

Side effects from the vaccine are severe



DATA SHOWS SHORT-TERM MILD - MODERATE REACTIONS TO THE VACCINE THAT ARE EASILY RESOLVED. SIDE EFFECTS SUCH AS HEADACHE, CHILLS, FATIGUE, FEVER, MUSCLE PAIN WERE OBSERVED IN CLINICAL TRIALS BUT TAKE NOTE THAT THESE SIDE EFFECTS ALSO INDICATE THAT THE VACCINE IS WORKING TO STIMULATE YOUR IMMUNE SYSTEM,

We don't know what is in the vaccines



PFIZER-BIONTECH HAS RELEASED AN INGREDIENT LIST WHICH CAN BE FOUND HERE:

[HTTPS://WWW.FDA.GOV/MEDIA/144414/DOWNLOAD.](https://www.fda.gov/media/144414/download)

CONSULT A DOCTOR ON WHETHER YOU SHOULD GET THE VACCINE IF YOU HAVE A HISTORY OF SEVERE ALLERGIES TO ANY INGREDIENT. ADDITIONALLY, THE VACCINE DOES NOT CONTAIN ANY MICROCHIPS OR TRACKING DEVICES.