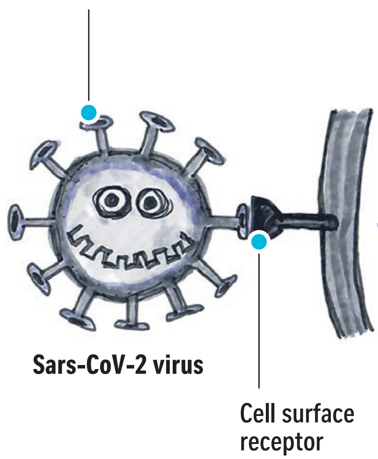
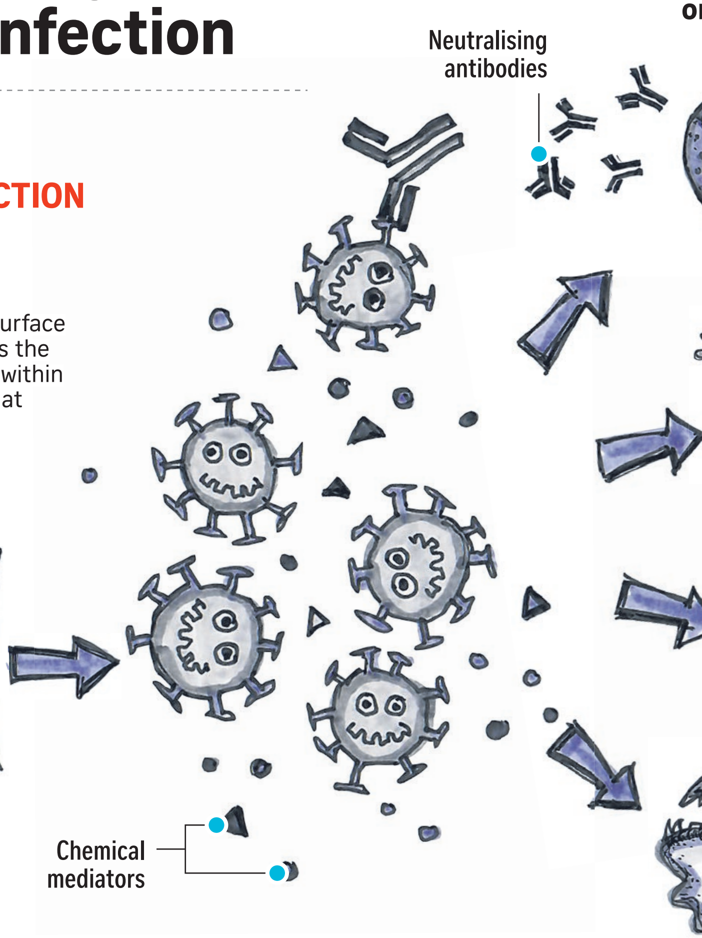
How the body fights off coronavirus infection

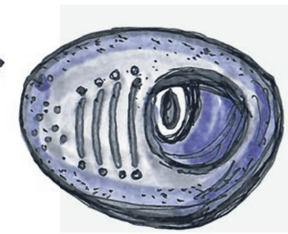
CELLS ACTIVATED FOLLOWING VIRUS INFECTION OR VACCINATION:

Spike protein
Coronavirus spike protein binds to surface receptors on airway cells. This allows the virus to enter the cells. It replicates within and triggers release of chemicals that activate the immune system.





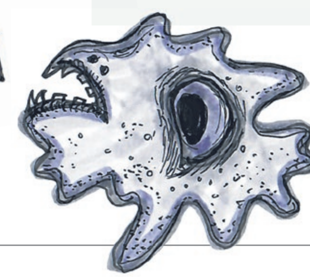
Cells activated following virus infection or vaccination:



Plasma cells
Produce antibodies that attach to viral proteins, neutralising the virus.

T Helper-cells
Release chemicals that recruit and prime other immune cells against the virus. Another family of T-cells directly target and kill virus-infected cells.

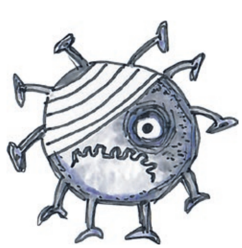
Memory B-cells
Retain memory of their previous encounter with a virus. This allows them to trigger a more effective immune response when they come across the same virus again.



Dendritic cells
Detect and engulf infected and dead cells. They present virus antigens to T-cells, initiating the immune response.

POSSIBLE COVID-19 VACCINES COULD COME IN VARIOUS FORMS, BUT EACH IS DESIGNED TO TEACH THE IMMUNE SYSTEM HOW TO RECOGNISE AND FIGHT OFF THE VIRUS:

Inactivated virus vaccine
Whole virus that has been chemically inactivated, so that it can no longer cause the disease



Live attenuated vaccine
Weakened virus that causes mild infection, and tends to create a strong, long-lasting immune response

Recombinant protein vaccine
Specific pieces of the virus (for example, spike protein) that are synthesised in a laboratory, and that the body recognises as a virus infection. This is linked to an adjuvant, a molecule which helps boost the immune response

Viral vector vaccine
Adenovirus (a group of common viruses) or other virus engineered to carry selected coronavirus genes

DNA vaccine
DNA plasmid, or ring, that encodes the coronavirus spike protein gene

RNA vaccine
Lipid (fat) nanoparticle that encapsulates RNA encoding spike protein

Source: NATIONAL HEALTHCARE GROUP ILLUSTRATIONS: DR BENJAMIN SEET STRAITS TIMES GRAPHICS