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Health and wellness initiatives - Lunch and Learn

'COVID-19: latest developments in the search for effective COVID-19 vaccines and immune-based therapies'

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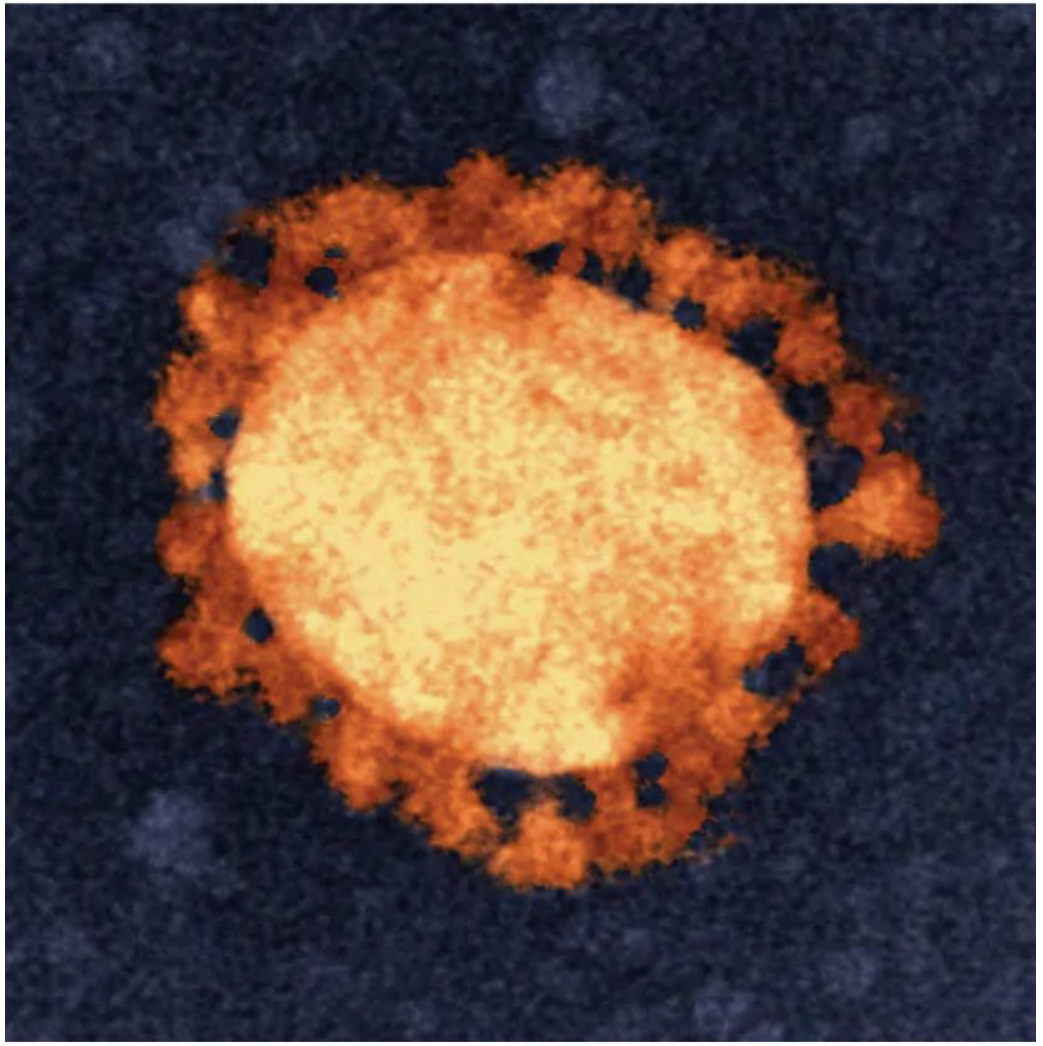
What is COVID-19?

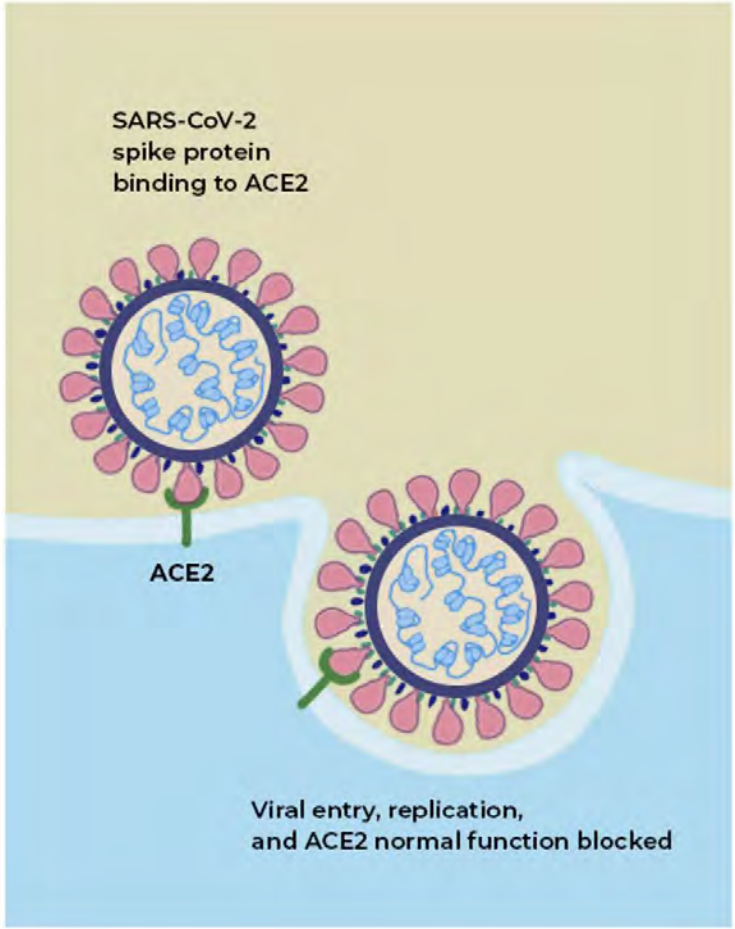
- A virus is a package of parasitic genetic material
- This coronavirus is called SARS-Cov-2
- SARS-Cov-2 causes COVID-19.

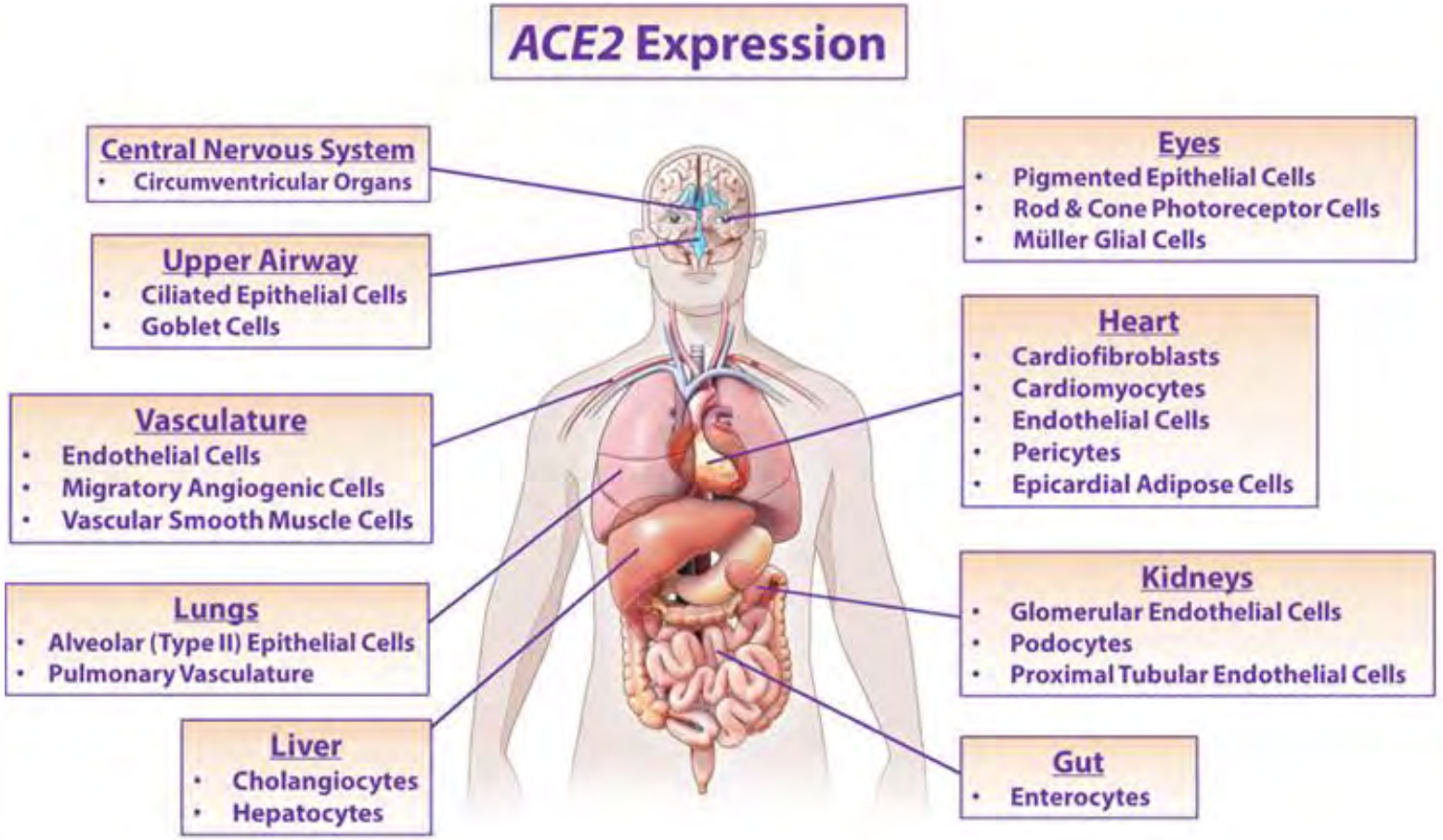


An electron-microscope image of the COVID-19 virus. CSIRO

How does it infect you?

Spike proteins on the virus bind to ACE-2 proteins on our cells





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Immune system is usually effective against COVID-19

- ***T cells kill infected cells***
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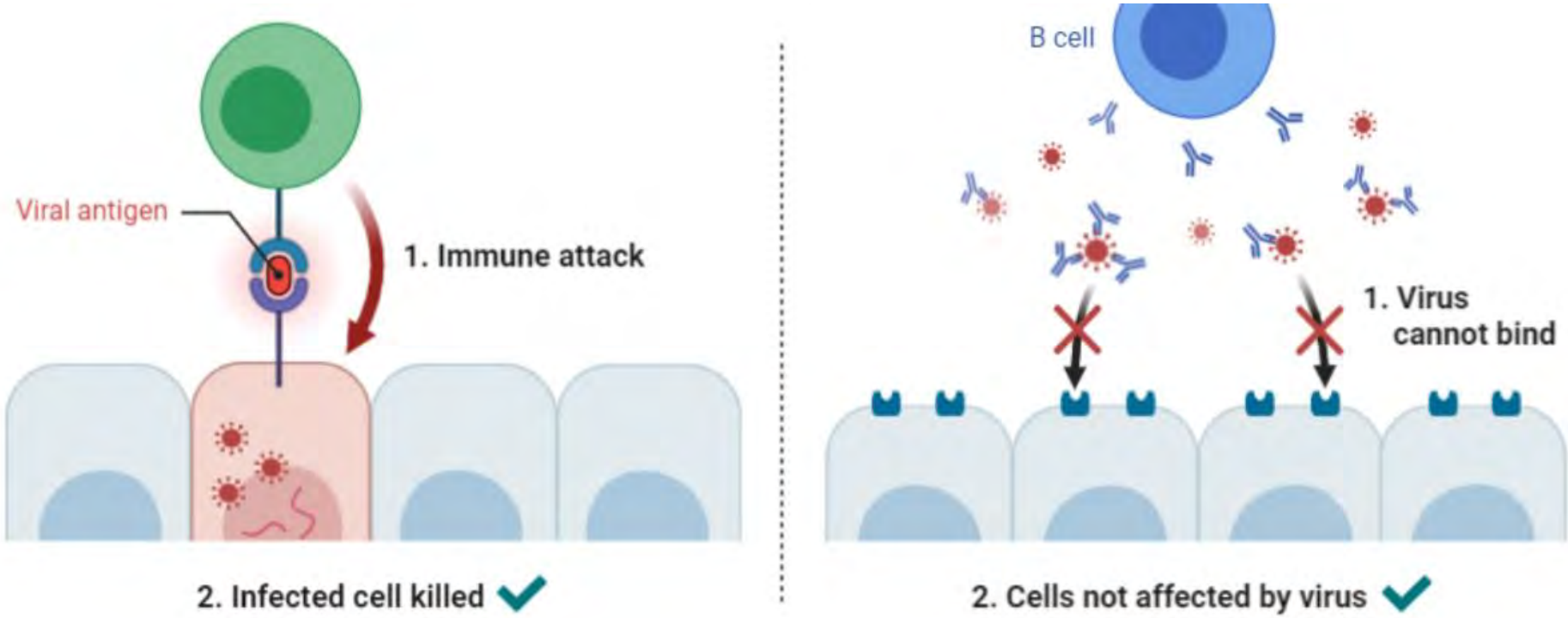
- ***Antibodies block virus infection***



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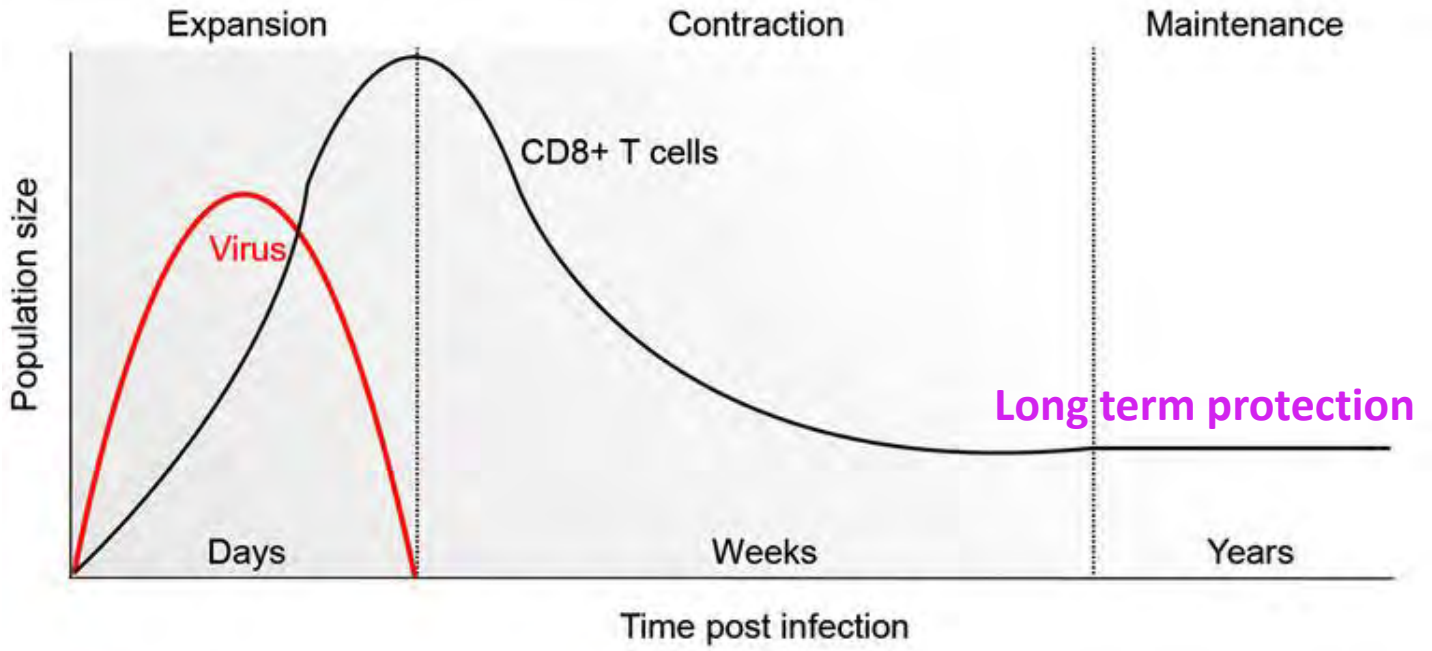
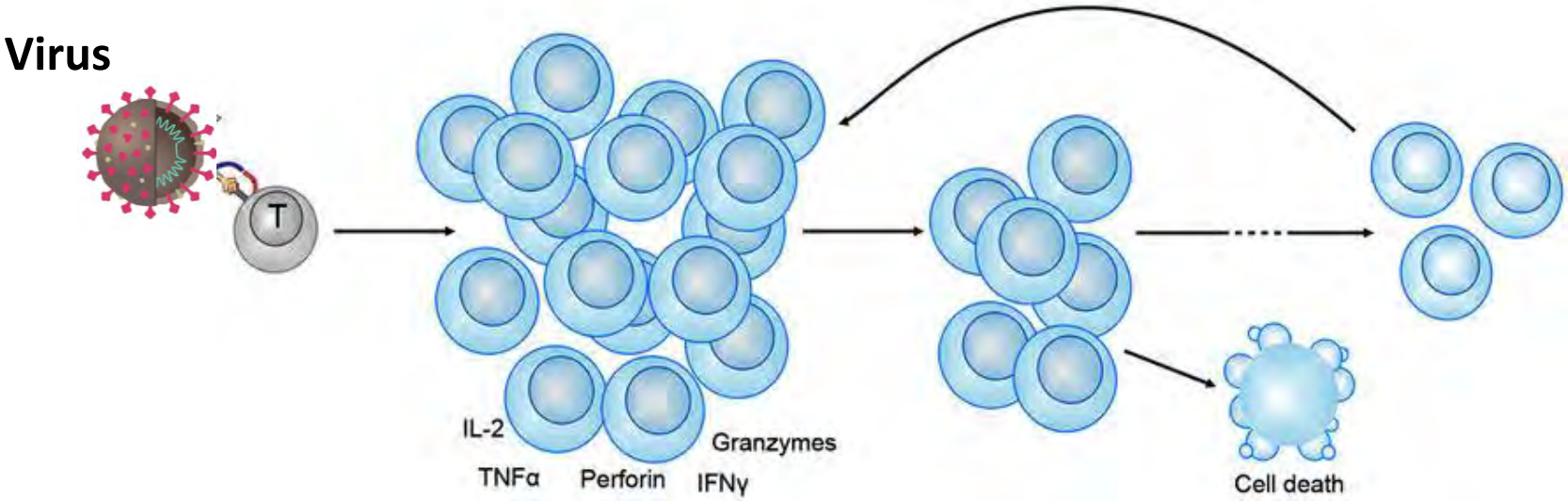
It takes time to build an immune army…..





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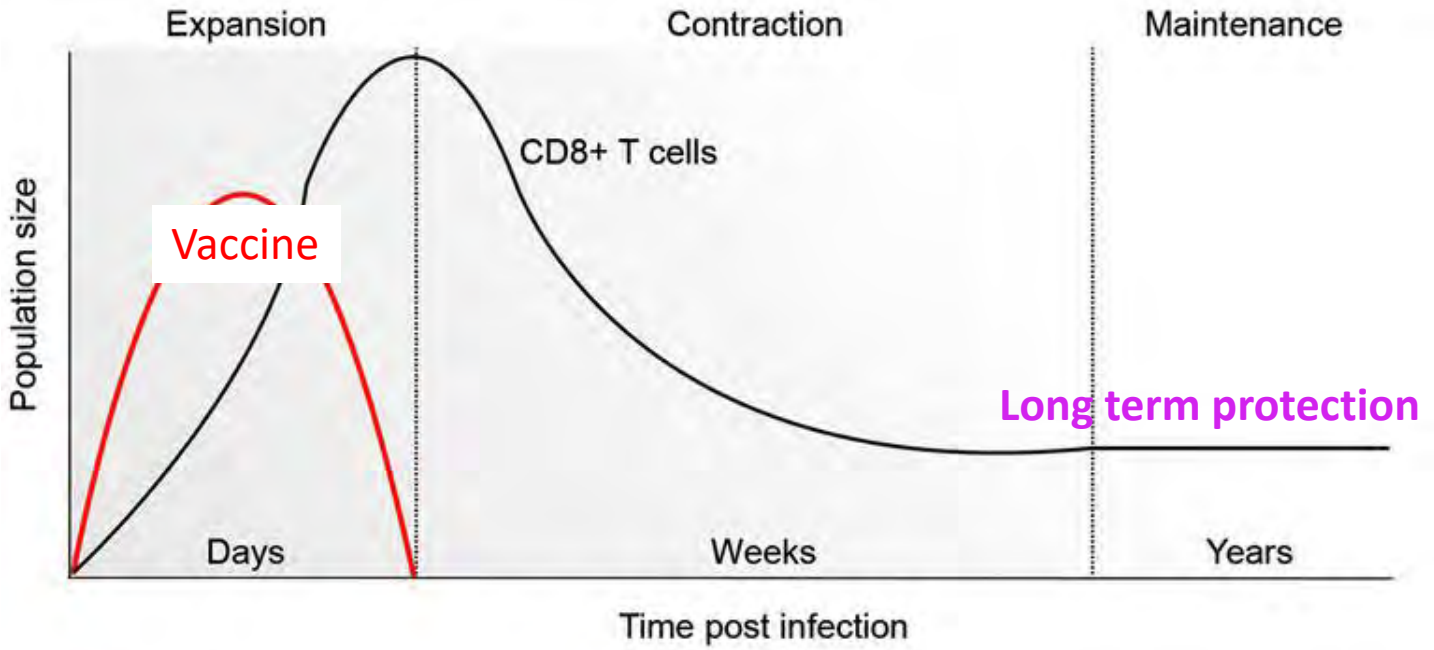
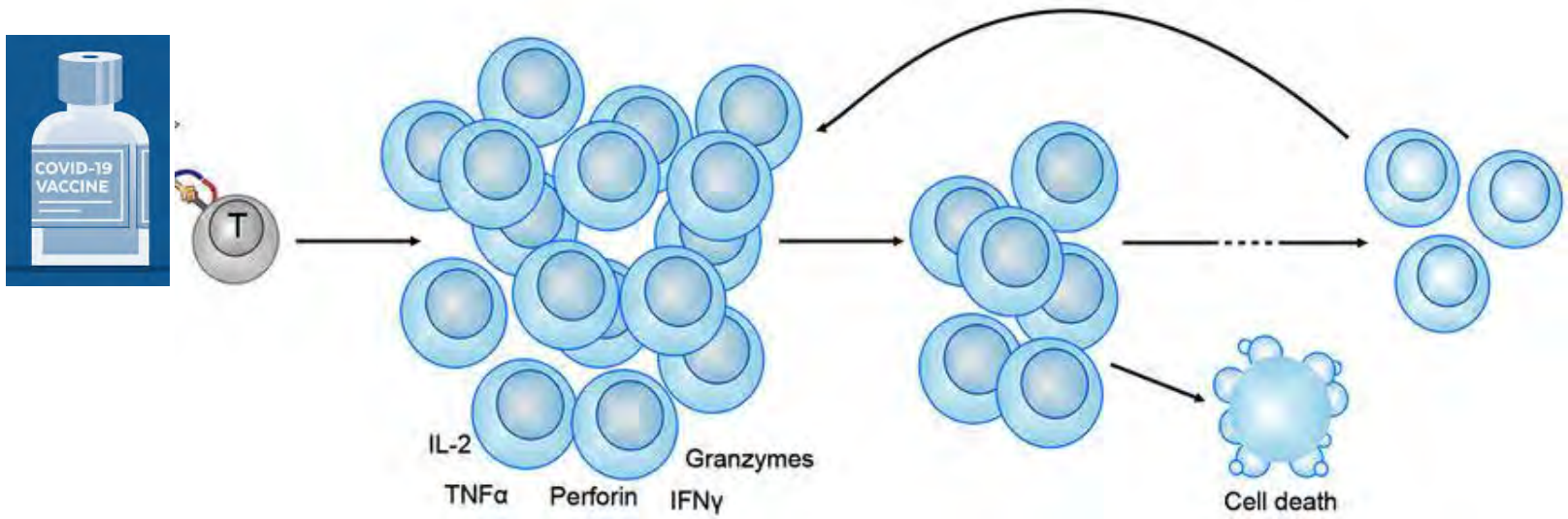
Ideally, this immune army would be ready before infection.

This is the aim of the vaccination program.

Vaccines induce the same protective immune response



Vaccine



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Vaccines likely to be used in Australia's rollout

- **Pfizer/BioNTech) (10M doses (plus 10M)**
- mRNA; 2 doses; reliant on overseas supply
- Works well in young and old
- Prevents severe disease
- ~95% efficacy compared to placebo
- Difficult to store (requires ultra cold refrigeration)

- **Astra-Zeneca (Oxford) (53M doses)**
- adenovirus; 2 doses; can be made in Aust (CSL)
- Works well in young. Lack of data for older people.
- Prevents severe disease
- Easy to store (requires ultra cold refrigeration)
- Efficacy variable, but ~80%

- **Novavax (51M doses)**
- Recombinant protein; 2 doses;
- Easy to store (requires ultra cold refrigeration)
- Prevents severe disease
- ~90% efficacy

GOOD NEWS

- All the vaccines are safe
- All significantly reduce serious disease and hospitalization
- No subgroups identified where they are ineffective
- Some evidence they reduce transmission
- Enough doses available to vaccinate whole population
- All can be adapted to work against variant viruses

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Caveats to all COVID-19 vaccines

- We do not know how long they provide protection (at least 3 mo).
- We know very little about their effect on asymptomatic disease (proabably help)
- We don’t know how well they prevent disease transmission. (probably reduce)
- Some are difficult to store and distribute.
- Many individual subgroups are yet to be specifically tested (children, pregnant women, aged)
- Their effectiveness may be lower against some mutant variants. Updates may be required.

Virus variants (mutant viruses)

- **Viruses always mutate – it is not surprising that several have emerged**
- The concerning ones have mutations affecting the spike protein
- Vaccines target the spike protein, so changes can affect vaccine effectiveness.
- Vaccine efficacy seems lower against several variants.
- Some appear to be more transmissible (more infectious).
- Some (controversial) appear to be more dangerous.
- Variants will continue to appear – most have no effect, some may make the virus more transmissible; others may make it weaker.

Summing up

- COVID-19 continues to spread and further outbreaks are likely in Australia.
- Vaccines will offer a lot of protection, especially against serious disease.
- Virus variants remain an ongoing threat.
- Vaccines will not immediately end the pandemic.
- Masks, social distancing and monitoring for outbreaks will be around for a while.
- “Be alert, but not alarmed”.

Thanks and questions?