

Vaccine trials show promise

Three front runners in the Covid-19 vaccine race have shown they can trigger immune responses which help the body fight the virus. The results offer hope, but more trials on more people need to be done to make sure they will really work.

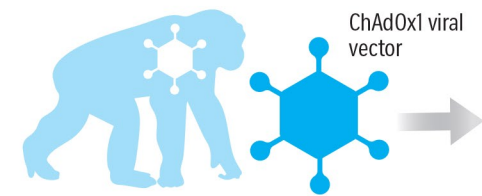
THE THREE VACCINES

ChAdOx1-S (Now at Phase III)

Developer: **University of Oxford and pharmaceutical giant AstraZeneca**

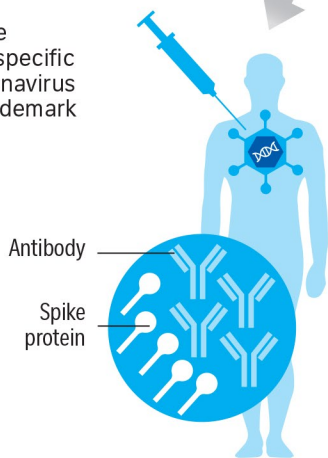
Type of vaccine: **Non-replicating viral vector**

1 This vaccine is made using a weakened version of the virus that causes the common cold in chimpanzees.



2 It also contains the genetic code of a specific protein of the coronavirus that gives it its trademark spikes.

3 When the vaccine enters cells inside the body, it uses this genetic code to produce the surface spike protein of the coronavirus.



4 This induces an immune response, priming the immune system to attack the coronavirus if it later infects the body.



What's next

A trial involving almost 50,000 people in various countries, including Britain and the US.

Adenovirus Type 5 Vector (Now at Phase II)

Developer: **China vaccine company CanSino Biologics and Beijing Institute of Biotechnology**

Type of vaccine: **Non-replicating viral vector**



This vaccine works in a similar way to the one being developed by Oxford and AstraZeneca, using a weakened and modified human cold virus to carry genetic material from the coronavirus into the body.

What's next

It has already been approved for use by the Chinese military, and a large international trial is being planned.

LNP-mRNAs (Now at Phase I/II)

Developer: **Germany's BioNTech, China's Fosun Pharma and Pfizer of the US**

Type of vaccine: **RNA**



This involves injecting snippets of the viral genetic code into the patient. The person does not get infected, but his body still mounts a protective response.

What's next

The paper on the Pfizer study is currently undergoing scientific peer review.

SO FAR



- The vaccines appear safe, with no dangerous side effects.
- They stimulate the body to mount a protective response, through the production of

immune system soldiers that can help the body fight off invaders. These include neutralising antibodies, which disable the virus; binding antibodies that bind to the virus, flagging it or the infected cell for attack; and T-cells, which kill virus-infected cells.



The latest findings from the three trials relate to preliminary results from Phase I and II of the clinical development process.

THE DEVELOPMENT CYCLE OF A VACCINE TYPICALLY HAS MULTIPLE PHASES:



NUMBER OF COVID-19 VACCINES BEING TESTED AT EACH PHASE

140

PRE-CLINICAL TRIALS

Before testing is done on people.

10

PHASE I*

Small groups of people receive the trial vaccine to test if it is safe, if there are side effects and the immune response it provokes.

10

PHASE II*

The clinical study is expanded and could include those most at risk of the disease.

3

PHASE III*

The vaccine is given to thousands of people to monitor on a much larger scale if it works and is safe.

Sources: WORLD HEALTH ORGANISATION, UNITED STATES CENTRES FOR DISEASE CONTROL AND PREVENTION, BBC, CNN
TEXT: AUDREY TAN
STRAITS TIMES GRAPHICS

NOTE: *Phases of clinical development