WHAT ARE VIRAL VECTOR VACCINES AND HOW DO THEY WORK?

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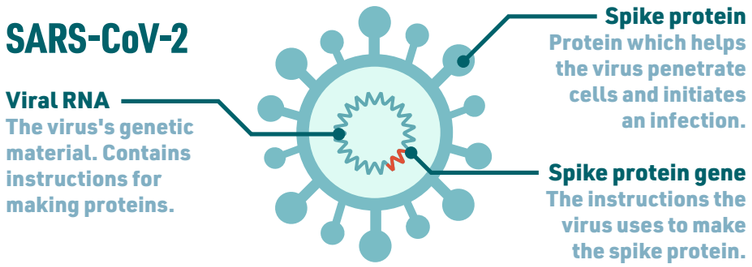
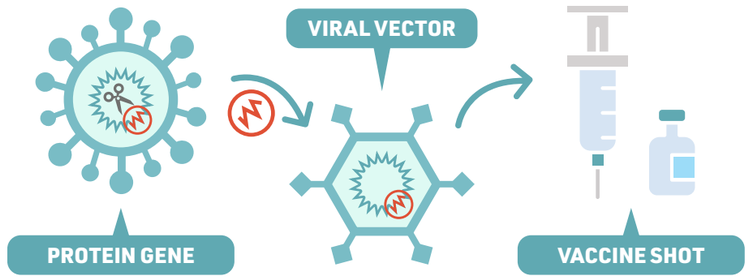
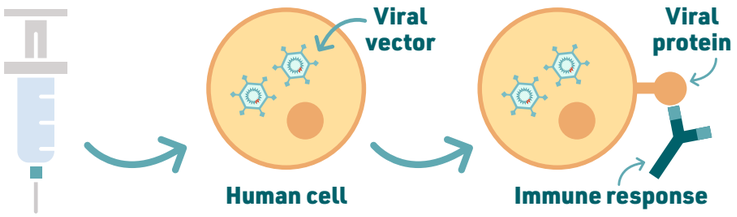


The SARS-CoV-2 virus contains a gene which the virus uses to make its spike protein. Scientists have identified this gene and can alter the genetic material of other viruses to contain it.



The gene for the SARS-CoV-2 spike protein is added to the genetic material of another virus: a viral vector. The viral vectors are genetically altered so they can't cause disease.



The vaccine contains the viral vector. Once the viral vector is inside our cells, it produces the virus spike protein. This then triggers an immune response in our bodies.

VIRAL VECTORS: BENEFITS AND CHALLENGES

VACCINE PRODUCTION

These vaccines can be made relatively quickly. Knowing the genetic code for the viral protein is all that's needed to start development.

SAFETY OF THE VACCINES

The viral vectors used in these vaccines are modified so that they can't cause disease. The genetic instructions for making the SARS-CoV-2 spike protein are broken down in our cells after the protein has been produced.

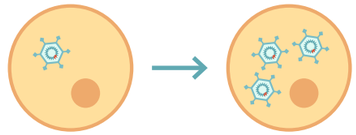
MINOR SIDE EFFECTS

Viral vectors cause a strong immune response. This can mean that minor side effects such as headache and fever are more common.

VIRAL VECTOR VACCINES FOR COVID-19

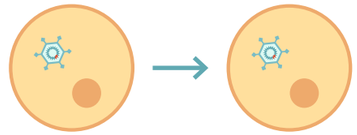
There are two types of viral vector vaccines: replicating viral vector vaccines or non-replicating viral vector vaccines. The vaccines for COVID-19 are non-replicating, which require higher doses but are safer than replicating viral vectors.

REPLICATING



Produce new viral vectors in the cells they enter.

NON-REPLICATING



Do not produce new viral vectors in the cells they enter.

WHAT VIRUSES ARE BEING USED AS VECTORS?

Different viruses can be used as viral vectors in these vaccines. The COVID-19 viral vector vaccine candidates use a range of different viral vectors to deliver their genetic cargo.

HUMAN ADENOVIRUS (Ad) VECTORS

Gamaleya Research Institute (RUS): Ad5 & Ad26
Johnson & Johnson (USA): Ad26
CanSino Biologics (CHN): Ad5

PRIMATE ADENOVIRUS (Ad) VECTORS

Oxford/AstraZeneca (UK): Chimp Ad
ReiThera (ITA): Gorilla Ad

Some people might already have some immunity to the human adenoviruses, which cause a small proportion of common colds. This immunity means the vector produces an immune response, potentially reducing vaccine effectiveness.