

HOW DOES THE COVID VACCINE HELP PROTECT YOU?

Vaccines work by training your body to fight off viruses with which you come into contact. Here we explain how vaccines do this and in particular how they work against the virus which causes COVID-19. We also explain how to interpret antibody blood tests.

HOW DO VACCINES WORK?

Viruses contain building blocks called proteins. When a person is infected, these viral proteins (or 'antigens') trigger an immune response to fight off the infection. Sometimes this natural immune response is too slow or not strong enough to protect that person from getting very ill.

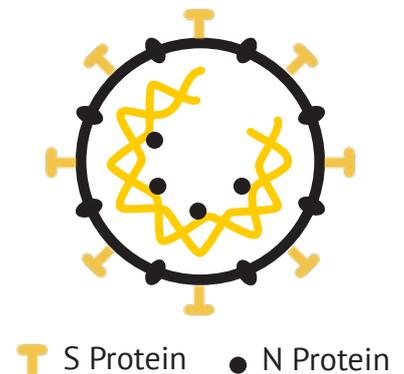
Vaccines use harmless versions of these proteins to train your immune system in advance of getting infected. This helps protect you from getting ill if you do come into contact with the virus.

Whilst being fully vaccinated can protect you from severe infection and/or death, it cannot necessarily prevent an individual getting infected.

WHAT IS THE COVID-19 VIRUS?

The COVID-19 virus is composed of many different proteins. These proteins include the 'Spike (S) protein' and the 'Nucleocapsid (N) protein'

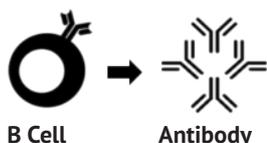
If you get infected by the COVID-19 virus, your body develops immune responses to the different proteins. All of the current vaccines use a harmless version of the S (spike) protein to train your **T** immune system.



NOW FOR THE SCIENCE...

...HOW YOUR IMMUNE SYSTEM RESPONDS TO INFECTION AND VACCINES

There are many ways your immune system fights off infection, but two important cells are B cells, which produce antibodies, and T cells, which attack and kill infected cells. T and B cells exist in billions of variations.



B cells produce and release antibodies against the antigen (protein) of the infecting virus.

They 'remember' the antigens they have seen before and Memory B cells form to respond more quickly in future.



There are 2 main types of T cells:

- Helper T cells which help B cells to make antibodies.
- Cytotoxic T cells which kill any of your own cells which are infected with the virus.

HOW DO THE COVID-19 VACCINES WORK?

mRNA vaccines (e.g. Pfizer, Moderna)

An exciting new form of vaccine. The vaccine contains some genetic material from the virus, which contains the instructions to build the 'spike protein'. Following vaccination these instructions last for about 72 hours, during which time your body will produce 'spike proteins', which will trigger your immune system.

Vector-based vaccines (e.g. Oxford-Astra Zeneca)

Uses a harmless virus to deliver the 'spike protein', which your body's immune system will respond to.

Other types of vaccine are likely to be available soon e.g. those using inactivated virus.

CAN WE USE ANTIBODY TESTS TO CHECK FOR IMMUNITY?

Testing for antibodies is not yet considered to be useful to provide information on your risk of infection following vaccination, as antibody levels don't tell the whole story.

The true indicator of response to ('efficacy' of) vaccines remains assessing how many patients become ill with COVID-19 after vaccination, rather than relying on blood tests. However, this can be affected by a person's social distancing behaviour, and the vaccination status of people with whom they come into contact.

Ongoing research has started to show that the presence of neutralising antibodies could be the best laboratory predictor of 'protection' from getting ill with COVID-19. However, measuring neutralising antibodies is not practical outside of research studies, on a large scale. Researchers are continuing to investigate if non-neutralising antibodies, detected in an NHS clinical laboratory may also correlate with protection.

Commercial tests are available which test for antibodies against either the nucleocapsid protein (anti-N) or the spike protein (anti-S). Interpretation of tests are as follows:

Anti-N antibody positive



Suggests the presence of prior infection.

Anti-S antibody positive



Can be positive as a response to vaccination or infection.





WHAT DO I NEED TO CONSIDER?

- It usually takes your body 2-3 weeks to make antibodies following vaccination. Hence, testing for antibodies, if it takes place, should occur after this period.
- Patients taking immunosuppressant medications may take longer to make antibodies. They may also produce fewer antibodies compared with healthy individuals.
- Different types of immunosuppression may have an unequal impact on different aspects of the immune system, e.g. antibody levels may be reduced in patients receiving B-cell depletion agents (Rituximab).
- The meaning of a negative antibody result for individuals that have received a COVID-19 vaccine is unknown, especially in immunosuppressed patients.
- It is not known how long antibodies will last in your body after infection or vaccination.
- Tests will differ in their sensitivity (accuracy), and it is important that tests are performed in a fully accredited laboratory.
- Some antibody tests give a measure of the amount of antibody present. There is variability in reporting of antibodies by different laboratories, although there is an ambition to standardise reporting to make it easier to compare. For example, the WHO (World Health Organisation) provides a way for labs to report antibodies in terms of 'binding antibody units per ml' or BAU/ml.
- Different vaccines may predictably produce different immune responses, e.g. Oxford-AstraZeneca produces better T-cell responses.

WHAT DOES THIS MEAN FOR ME?

- Importantly, you should not interpret the results of an antibody test as an indication of protection from infection.
- This information sheet describes how your immune system responds to vaccination. For further advice on protecting yourself from infection, we recommend you follow guidance, which will be regularly updated and can be found on each of the Kidney Charities Together Group websites.

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PROTECT YOURSELF • STAY ALERT • SEEK ADVICE