While vaccines have proven extraordinarily successful...having medications that can treat the virus is still going to be very important.
A novel Covid-19 treatment derived from llamas could be on the cards, say researchers from the Rosalind Franklin Institute.

The potential therapy, drawn from nanobodies – a smaller, simpler form of antibodies – has shown ‘significant potential’ in early trials, according to the team behind the research.

They found that short chains of the molecules, which are produced by llamas naturally in response to any infection, can effectively target the SARS-CoV-2 virus that causes Covid-19.

Although the treatment has, so far, only been tested in laboratory animals, Public Health England (PHE) has hailed it as one of the ‘most effective SARS-CoV-2-neutralising agents [we have] ever tested’.

This Covid-19-fighting potency comes from the strength by which the nanobodies bind to the spike protein of the virus, thus blocking it from entering other cells and deeming it ‘neutralised’.

The research team, whose findings have been published in Nature Communications, were able to generate the nanobodies by injecting a portion of the SARS-CoV-2 spike protein into a llama thus inducing an immune response.

A small blood sample was then taken from the animal and researchers were able to purify the four most potent nanobodies that were capable of binding to the virus. Subsequently, they combined these nanobodies in chains of three – also known as ‘trimers’ – to enhance their binding ability.

The team found that three of the trimers they produced neutralised both the ‘original’ variants of Covid-19 and the ‘alpha’ – or ‘Kent’ – variant, while a fourth nanobody chain was able to neutralise the ‘beta’ variant that was first identified in South Africa.

When one of the trimers was administered to hamsters infected with SARS-CoV-2, it resulted in a marked reduction in disease, improved weight retention and a lower viral load in the lungs and airways after seven days compared to hamsters that remained untreated.

PHE has described the research as having significant potential ‘for both the prevention and treatment of Covid-19’, suggesting that the llama-derived nanobodies could be a cheaper, easier alternative to human antibodies.

While human antibodies can be administered to more serious cases of Covid-19 via injection, scientists believe nanobody therapy could be given as a simple nasal spray at home.

James Naismith, director of the Rosalind Franklin Institute, said: ‘While vaccines have proven extraordinarily successful, not everyone responds to vaccination and immunity can wane in individuals at different times. Having medications that can treat the virus is still going to be very important, particularly as not all of the world is being vaccinated at the same speed and there remains a risk of new variants capable of bypassing vaccine immunity emerging.’

The researchers, who were funded by the UK Research and Innovation’s Medical Research Council, the Engineering and Physical Sciences Research Council, the EPA Cephalosporin Fund and the Wellcome Trust, hope that the research could develop a so-called ‘platform technology’, ensuring that it can be readily adapted to help fight other diseases in the future.