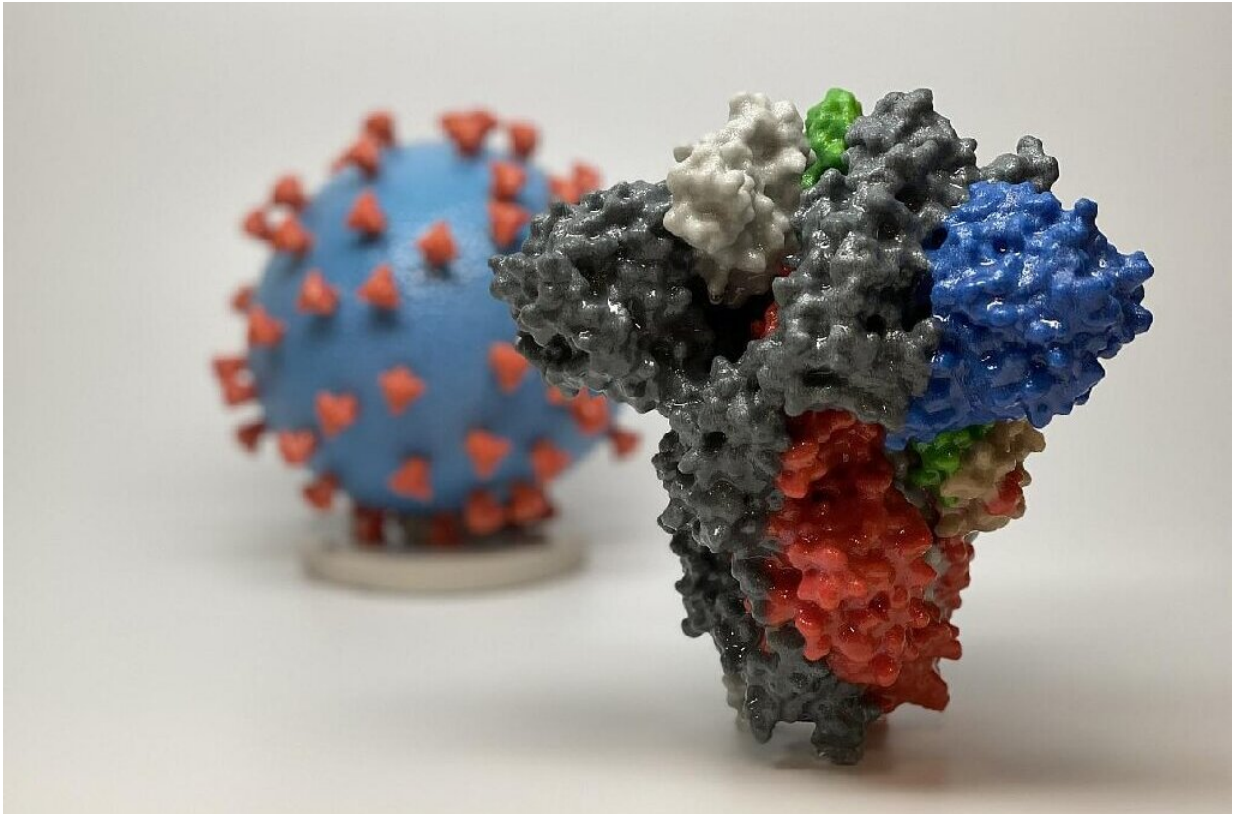


New virus mutation raises vaccine questions

January 13 2021, by Paul Ricard



One mutation, known as E484K, which emerged initially in South Africa and has also been discovered in Brazil and Japan, has raised alarm among researchers

As the British coronavirus variant occupies countries' pandemic plans due to its increased transmissibility, other mutations to the SARS-CoV-2 are provoking concern among scientists who are scrambling to work out if they will still respond to vaccines.

In particular, one mutation, known as E484K, detected initially in South Africa and on subsequent variants in Brazil and Japan, has raised alarm among researchers.

Ravi Gupta, professor of microbiology at the University of Cambridge, said it is this mutation—and not the much-covered British variant—that is "the most worrying of all".

Although research into the new variant is limited, a Brazilian study this month looked at a patient who had recovered from COVID-19 only to become reinfected with the new, mutated strain.

The paper has yet to be peer-reviewed, but the authors found that the E484K mutation could be "associated with escape from neutralising antibodies"—meaning it could bypass the body's natural defence memory that bestows immunity.

As countries accelerate their vaccination programmes, there is concern that the new mutation may render certain vaccines less effective.

The Pfizer and Moderna [vaccine](#), for example, use mRNA technology to deliver instructions to the body to produce a harmless [coronavirus](#) spike protein, which the [immune system](#) then learns to kill in anticipation of a genuine infection.

With E484K, as with the British variant, the mutation occurs on the virus' spike protein, which allows it to bind more easily with human cell receptors, potentially heightening its infectiousness.

Gupta said the mutation "could be the start of problems for spike vaccines".

"They should all be effective at the moment but we worry about further

mutations occurring on top of these ones," he told AFP.

'Bypass current protection'

Pfizer and German partner BioNTech said last week that their vaccine was effective against the N501Y mutation found on the British virus variant, known as B117.

Francois Balloux, professor of Computational Systems Biology and Director of University College London's Genetics Institute, said it was unlikely that the South African variant had mutated sufficiently to "bypass the protection provided by current vaccines".

But, he warned: "The E484K mutation has been shown to reduce antibody recognition.

"As such, it helps the virus SARS-CoV-2 to bypass immune protection provided by prior infection or vaccination," Balloux said.

There have been several mutations to the novel coronavirus since it emerged in late 2019, and most have had a negligible effect on its transmissibility or severity.

But the British variant has shown in several studies to be up to 70 percent more infectious than normal virus strains.

And the South African variant appears to be more effective at avoiding the body's natural response.

New vaccines?

One pre-print study in December concluded that the two new variants show that SARS-CoV-2 "has the potential to escape an effective

immune response".

Researchers studied what happened to the virus when it was left in contact with plasma taken from a patient who had recovered from COVID-19.

Within three months, the virus had taken on several mutations, including E484K.

The authors suggested that "vaccines and antibodies able to control emerging variants should be developed."

Lead researcher Rino Rappuoli, an immunologist at pharma giant GlaxoSmithKline, told AFP that the current spike protein [mutations](#) should not pose a problem for existing vaccines, however.

And even if the virus mutates to better evade immune response, vaccines should bestow at least some level of effective immunity.

"Even if you lower the efficacy, there would normally still be some neutralisation of the [virus](#)," Vincent Enouf, from Paris's Pasteur Institute, told AFP.

To be on the safe side, Gupta advocated an accelerated vaccination programme, bestowing as much immunity as current vaccines can deliver "as fast as possible all over the world."

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Citation: New virus mutation raises vaccine questions (2021, January 13) retrieved 24 February 2023 from <https://medicalxpress.com/news/2021-01-virus-mutation-vaccine.html>

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