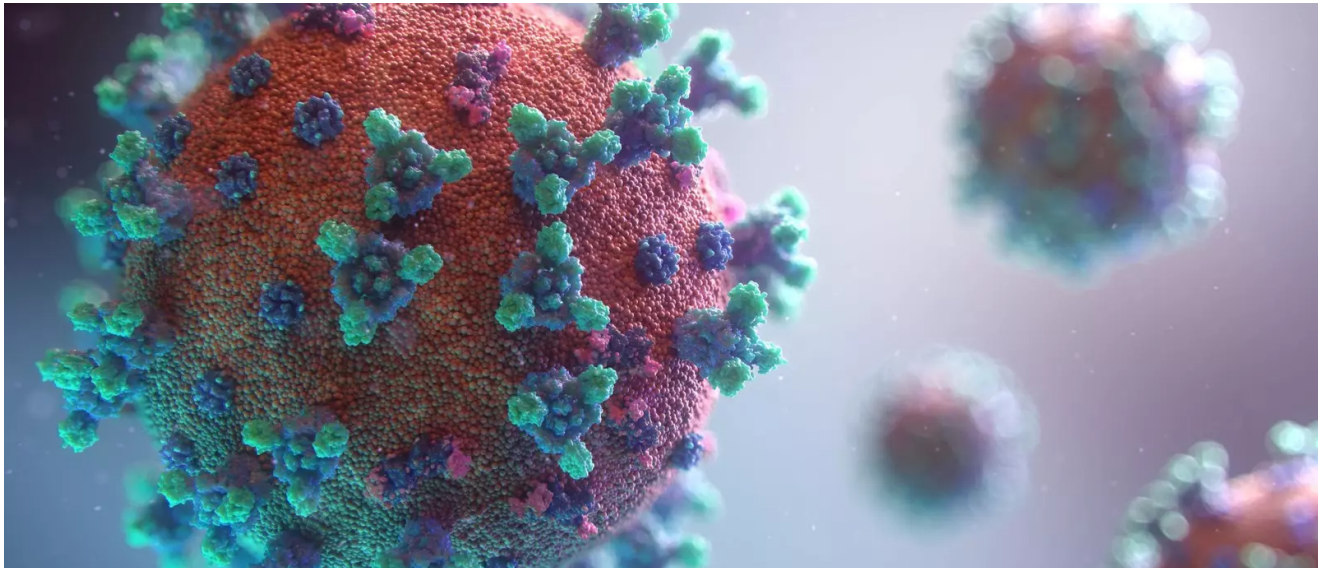




Explainer: This is how scientists detect new variants of COVID-19



Scientists have discovered a new COVID variant in South Africa.

Image: Unsplash/Fusion Medical Animation

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06:27



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This article was last updated on 26 November 2021.

- South African scientists have discovered a new COVID-19 variant.
- Around the world, it's a constant battle to keep up with new mutations.
- Here's how they detect new strains in a bid to keep ahead of the virus.

Scientists in South Africa [have discovered](#) a small number of cases of a new COVID variant. They're working to understand its potential implications but told a news conference that it had a 'very unusual constellation' of mutations.

They're concerned that they could help it evade the body's immune response and make the variant - named B.1.1.529 - more transmissible.

These scientists are part of a global network of government scientists and academics searching for new strains of COVID-19, like this and other previous variants - like Delta.

So how do scientists identify and track new COVID variants as they arise?

Viruses are microscopic parasites that can't survive for long outside the body of a host animal. As living organisms, they are much smaller than bacteria – the [polio virus, for example, is 10,000 times smaller than a grain of salt.](#)

But they do have their own DNA or RNA (Deoxyribonucleic acid and Ribonucleic acid), the [building blocks of life.](#)

This allows them to mutate into new forms. In the case of SARS-CoV-2, the virus that causes COVID-19, scientists have so far identified [four variants that have been classified as being of concern](#) because they spread more easily, are more virulent or resistant to vaccines.

So how are they detected? Alpha as an example

The UK or Alpha variant of the COVID-19 virus was first seen in Kent, southeast England, in September 2020. Dr Meera Chand was one of the epidemiologists monitoring the situation. "We immediately knew we had found something very concerning," she said in a post on the [Public Health England website.](#)

"Normally when you're looking at samples you would expect to see lots of small clusters made up of multiple strains that are all slightly different. But when we looked at Kent, we saw about 50% of the samples were extremely similar, forming one massive cluster."

So a team including specialists was quickly assembled to study the characteristics of the Kent samples. But they had a problem. Not enough samples had undergone full genome sequencing.

A scientist works on sequencing the genome of a COVID-19 variant at the Wellcome Sanger Institute, Cambridge, UK.

Image: REUTERS/Dylan Martinez

Help came from an unexpected quarter. Staff at local ‘lighthouse’ labs, where thousands of samples a day are tested, noticed a problem. Their tests were failing to pick up a gene which they expected to see. In fact, the missing gene turned out to be characteristic of the new COVID variant.

“Initially they thought there was an issue with the test. It wasn’t working, and the rate at which it wasn’t working was increasing very steeply,” said Dr Chand. “Identifying cases through the lighthouse labs was a huge leap ahead.”

Not least because whole genome sequencing takes time, and it quickly became clear that the new variant was spreading rapidly.

Are all mutations dangerous?

The U.S. Centers for Disease Control and Prevention (CDC) defines mutations as “changes in the genetic code of a virus that naturally occur over time when an animal or person is infected”.

“Most of the genetic changes we see in this virus are like the scars people accumulate over a lifetime – incidental marks of the road, most of which have no great significance or functional role,” says [Professor Stuart Ray of Johns Hopkins University School of Medicine](#).

“When the evidence is strong enough that a viral genetic change is causing a change in the behaviour of the virus, we gain new insight regarding how this virus works.”

Do vaccines protect against variants?

It’s too early to tell whether vaccines will offer the same level of protection against B.1.1.529 as they do against previous COVID variants.

But, vaccine makers, like Pfizer, have been [preparing for a scenario](#) where a new COVID variant is able to evade immunity established by existing vaccines and previous infection.

However, existing vaccines have continued to offer protection against other variants, such as Delta.

“The good news is that all of the WHO emergency use-listed vaccines do protect against developing severe disease, hospitalization and death due to the Delta variant,” said Dr Soumya Swaminathan, the World Health Organization’s chief scientist, on 1 July.

The World Economic Forum has set up the [COVID Action Platform to coordinate](#) the efforts of business and other stakeholders to minimize the impact of the pandemic on public health and limit its potential for further disruption to lives and economies around the world.

The Forum is also using its [UPLINK innovation crowdsourcing platform](#) to generate new ideas for actionable, scalable solutions to the challenges posed by COVID-19, including an [artificial intelligence app](#) to monitor COVID-19 infections remotely.

CORONAVIRUS, HEALTH, COVID19, PANDEMIC

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