

NTU team develops new Covid-19 rapid test that can detect virus variants

CLARA CHONG

A new Covid-19 rapid test that can detect variants of the virus has been developed in Singapore.

It produces results within 30 minutes and can be used directly on patient samples. It is also about 10 times more accurate than rapid antigen tests currently in use in the country.

The Variant Nucleotide Guard (VaNGuard) test is the first rapid test here to make use of a gene-editing tool known as Crispr.

Developed by scientists from Nanyang Technological University (NTU), the VaNGuard test uses a reaction mix containing a specific enzyme that acts like a pair of “molecular scissors”.

The enzyme targets specific segments of the genetic material of Sars-CoV-2 – the virus responsible for Covid-19 – and snips them off the rest of its viral genome. Successfully snipping off these segments is how the enzyme identifies the presence of the virus.

To ensure variants are not missed, two short genetic sequences, known as guide RNAs, are used to recognise sequences that are extremely similar across the variants but also unique to the virus.

Associate Professor Tan Meng How, who led the study, said yesterday: “Should these binding regions mutate, a



The Variant Nucleotide Guard test produces results within 30 minutes.
PHOTO: NTU

new test can be redesigned in under a week.”

Crispr technology is traditionally used in scientific research to alter DNA sequences, giving it the potential to cure – and not just treat – any disease caused by DNA differences.

Currently, antigen rapid tests that detect proteins called antigens on the surface of the virus are used in Singapore. Should a mutation affect the viral antigen, some of these tests may be ineffective.

Several strains of the Sars-CoV-2 have been identified globally, such as Britain's B117 strain, the Brazilian P1 variant and South Africa's B1351 variant.

Prof Tan, who is from NTU's School of Chemical and Biomedical Engineering, said the new test would likely cost slightly less than a traditional antigen rapid test when sold in the market.

The project was started in January last year and the NTU team hopes to obtain regulatory approval this year.

chongcjy@sph.com.sg