

Made-in-S'pore antibody test for multiple viruses now used globally

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A test developed by local researchers to help tackle the next pandemic is now in use in more than 90 countries.

Known as the multiplex surrogate virus neutralisation test (sVNT), it can detect if a person has antibodies capable of neutralising multiple viruses to prevent disease.

Such antibodies offer protection against a variety of highly pathogenic viruses, including variants of Sars-CoV-2 – the coronavirus that causes Covid-19.

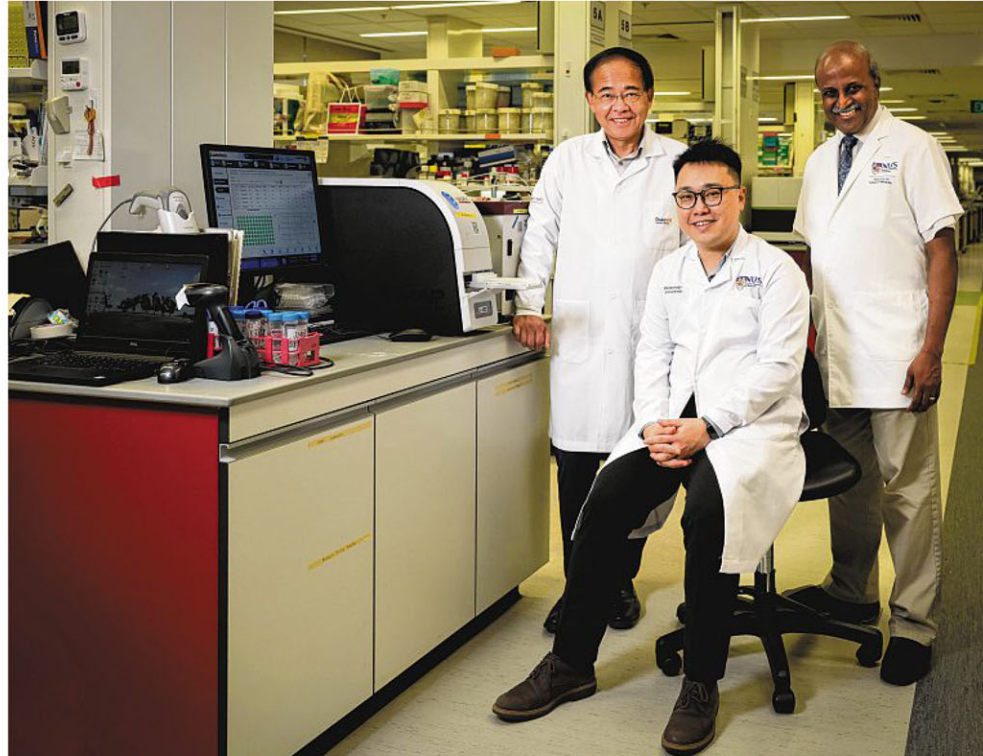
The test can also be used for other pathogens such as Ebola and henipaviruses, a group of zoonotic viruses such as Nipah.

Experts have warned that zoonotic viruses – transmitted from animals to humans, and vice versa – could spark future pandemics.

The test was developed by a team led by Dr Tan Chee Wah of the microbiology and immunology department at the NUS Yong Loo Lin School of Medicine (NUS Medicine) and Professor Wang Linfa of the emerging infectious diseases programme at Duke-NUS Medical School.

It has a number of benefits, Prof Wang noted, especially its ability to measure neutralising antibodies. “Neutralising antibodies are a functional measure of your immunity. So if you have a high level (of them), you will most likely be protected against future infection,” he said.

This ability to measure an individual's immunity can in turn be used to determine the efficacy of new vaccines, he added.



The test was developed by a team led by Dr Tan Chee Wah (centre) and Professor Wang Linfa (left), under the Integrated Innovations in Infectious Diseases (I3D) large collaborative grant, funded by the National Medical Research Council. Professor Paul Tambyah from NUS Medicine is lead principal investigator of I3D. ST PHOTO: GIN TAY

Such insights could then be used to make future vaccines more effective by broadening their coverage to include a variety of different, but related, viruses, said Prof Wang.

The test can also support contact tracing in future epidemics by enabling the authorities to identify individuals who were previously infected and developed antibodies,

thereby uncovering the chains of transmission.

It can be used on animals as well, Prof Wang added, noting its use in tracing the spread of Sars-CoV-2 from humans to white-tailed deer in a US study published in the journal *Nature Communications* in 2023.

This is important as future pandemics are likely to be the result of

zoonotic diseases, as was the case for Sars (severe acute respiratory syndrome) and Covid-19, said Professor Paul Tambyah from NUS Medicine.

Dr Tan noted that another advantage is that the test does not require the use of a live virus – which carries a risk of infection – to determine the presence of neutralising antibodies.

VITAL ABILITY

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PROFESSOR WANG LINFA of the emerging infectious diseases programme at Duke-NUS Medical School, on the test's ability to measure neutralising antibodies.

Instead, it requires only a spike protein from the virus – the component that the virus relies on to invade human cells, which is relatively harmless on its own.

The multiplex sVNT was developed under the Integrated Innovations in Infectious Diseases (I3D) large collaborative grant, funded by the National Medical Research Council.

Established under the Ministry of Health in 1994, the council oversees the development and advancement of medical research in Singapore.

The test kit is based on cPass, the first commercial tool to detect whether someone has antibodies that neutralise Sars-CoV-2.

Developed in 2020, cPass was created by a team led by Prof Wang, in collaboration with biotech firm GenScript and A*Star's Diagnostics Development Hub.

The US Food and Drug Administration granted cPass emergency use approval in November 2020.

However, cPass was limited in its

ability to detect the different variants of Covid-19 that emerged as the virus evolved, noted Prof Tambyah, who is also lead principal investigator of I3D.

This underscored the need for an enhanced test, he said.

The multiplex sVNT is now being used in more than 90 countries, Prof Wang noted.

This includes at institutions such as the University of Oxford, the University of Indonesia and the University of Melbourne.

The team is now trying to build a test that can be used for all the pathogens on the World Health Organisation's global priority list of antibiotic-resistant bacteria, Dr Tan said.

Prof Wang added: “The challenge now, and also our excitement, is trying to build up a really multi-family, multi-class surrogate virus neutralisation test, so that we're ready for any disease X”.

The term “disease X” refers to an unknown pathogen that could cause a serious global pandemic.

Since the outbreak of Covid-19, Singapore has been ramping up its pandemic preparedness efforts.

In 2022, the Programme for Research in Epidemic Preparedness and Response, headed by Prof Wang, was launched. With funding of \$100 million over five years, it aims to bring together experts from various fields to respond to future infectious disease outbreaks.

And in April 2025, a new statutory board – the Communicable Diseases Agency – was launched. It consolidates public health functions that detect and control infectious diseases, enabling a faster response to disease outbreaks.

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