

S'pore scientists' novel rapid test a boon for vaccine developers

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Scientists in Singapore have optimised a method for a simple, rapid test that will allow vaccine developers to get a more complete picture of how a vaccinated person's immune system responds to the Sars-CoV-2 virus.

The novel test zeroes in on how T-cells react to the virus that causes Covid-19. T-cells are white blood cells that are often overlooked compared with its more well-known sibling, antibodies.

Both T-cells and antibodies are jolted awake when viruses enter the body.

Antibodies are proteins that can bind to viruses and prevent them from infecting cells. But when cells are infected, T-cells step in to help clear the infection in the body.

Dr Anthony Tanoto Tan, senior research fellow at Duke-NUS Medical School's Emerging Infectious Diseases Programme, said: "The T-cell responses to Sars-CoV-2 cannot be accurately predicted by just measur-

ing antibody responses. Hence, it is important to measure both to fully evaluate the immune response against the virus."

He is the first author of a paper published on Wednesday in the *Journal of Clinical Investigation*.

Because they are easier to analyse than T-cells, scientists are more inclined to measure antibodies. Dr Tan said the traditional way to analyse T-cells involves isolating white blood cells.

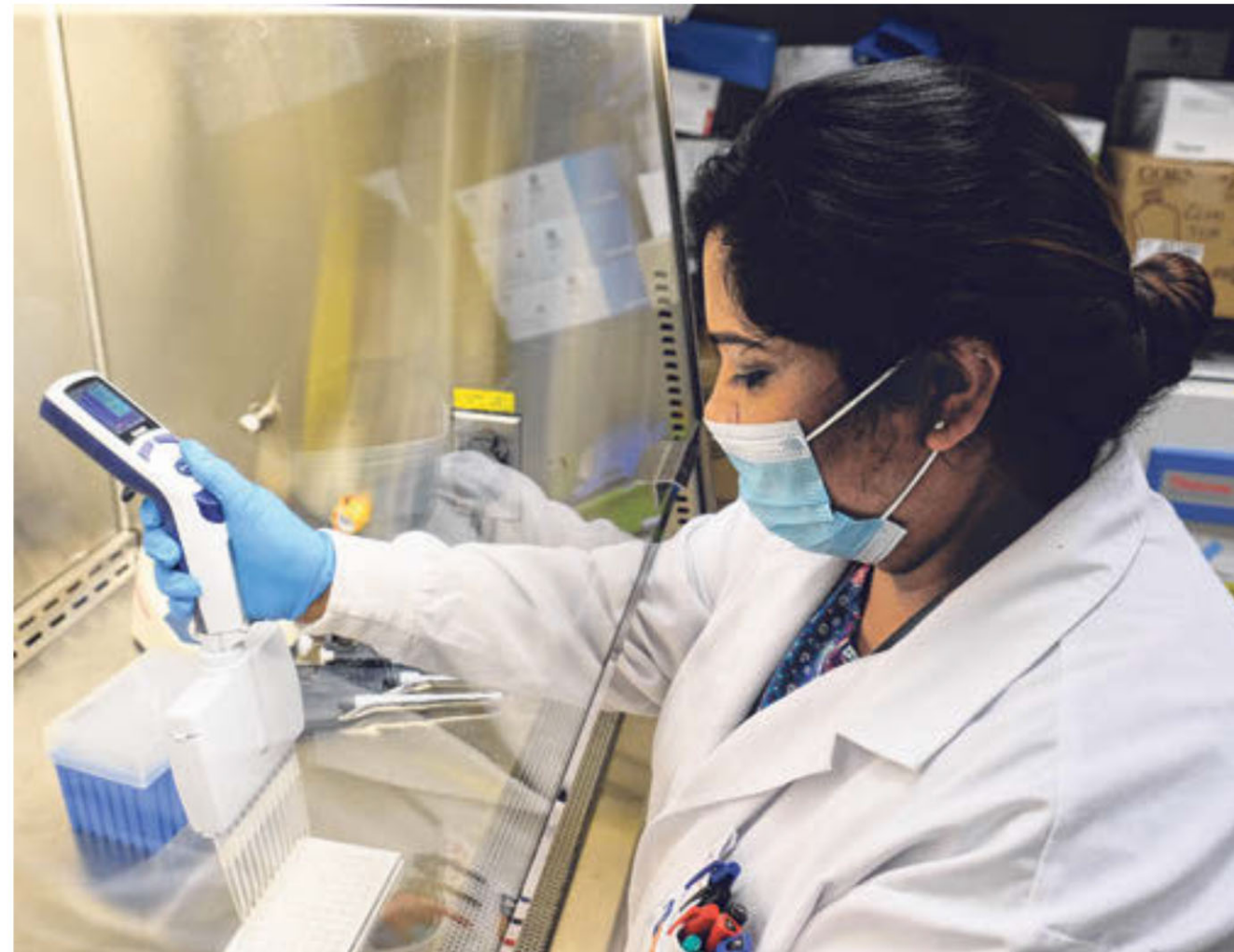
But this method requires a specialised lab and takes 10 hours of work and 1.5 days to get results.

To make T-cells more accessible to researchers, Dr Tan and his team validated a method that can analyse T-cells in less than a day, with less than three hours of work.

The whole blood sample can be processed without isolating the white blood cells.

Dr Tan added that the faster test is particularly beneficial for vaccinated people who have compromised antibody responses due to existing diseases or medications.

"It would be very important to assess the T-cell response in these in-



Research associate Kamini Kunasegaran from Duke-NUS Medical School coaxing T-cells from peripheral blood samples. T-cells are white blood cells that help clear an infection in the body.

PHOTO: DUKE-NUS MEDICAL SCHOOL

dividuals to understand if the vaccine could provide protective benefits."

For vaccine developers – especially those targeting new and more infectious variants – the test can help to assess T-cell responses by new vaccines.

To optimise the test, Dr Tan and his team used over 200 blood samples from both vaccinated and previously infected people.

The team added small fragments of the virus' spike protein into the blood samples. In response, the T-cells released chemical signals, which the scientists analysed and measured – to monitor the T-cell quality in each blood sample.

The researchers discovered and optimised the test method alongside clinicians from the National Centre for Infectious Diseases and Singapore General Hospital.

Commenting on the test, Associate Professor Sylvie Alonso, from the NUS Yong Loo Lin School of Medicine, noted that since the method in the study includes only two types of cytokines, additional cytokines may need to be included in the test to more accurately evaluate T-cell responses after vaccination or infection.

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