

**- Virus****Scientists here develop saliva ART as accurate as PCR test**

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Scientists here have developed a saliva antigen rapid test (ART) which is just as accurate as the polymerase chain reaction (PCR) test, yet takes only around 15 minutes to detect Covid-19.



The self-administered test has an accuracy rate of 97 per cent and is able to detect different Covid-19 viral variants, including Omicron. The test kit could hit the market in as soon as three months.

The 15 minutes or so needed to obtain the results of the test, known as the Parallel Amplified Saliva rapid POint-of-caRe Test (Pasport), is similar to the shortest time needed for current ARTs. For PCR tests, it takes between a few hours and three days to get results.

The test is the result of a research collaboration between Duke-NUS Medical School, Singapore General Hospital (SGH), National Cancer Centre Singapore (NCCS) and the National University of Singapore (NUS).

Dr Danny Tng, a medical officer at the Department of Infectious Diseases in SGH, and the lead inventor behind the test, said Duke-NUS and SingHealth have entered into a licensing agreement with medical supply company Digital Life Line for its commercialisation.

Professor Soo Khee Chee, Benjamin Sheares Professor in Academic Medicine at the SingHealth Duke-NUS Oncology Academic Clinical Programme, said the test, which requires the approval of the Health Sciences Authority for use here, could be available in the next three to six months.

One important innovation of the new test is that it can be done at any point in time – even after food. Current saliva tests have not been considered reliable enough to roll out on a large scale, as the concentration of viral particles in saliva “drops steeply” after one eats or drinks, Dr Tng noted.

For instance, the ability of other saliva ARTs to detect the Sars-CoV-2 virus after food is around 11.7 per cent to 23.1 per cent, he said.

“Therefore, saliva antigen rapid tests are usually reliable only when they are performed first thing in the morning, after an overnight fast and before breakfast or brushing teeth. This makes testing of saliva samples at other times of the day less reliable.”

The scientists were able to remedy this using a two-stage process for the Pasport.

Like most ARTs, Pasport uses nanoparticles to bind to the virus, but with a difference – an additional amplification mechanism is built into it such that it uses more nanoparticles in its test than other ARTs, said Dr Tng. This means the viral “signal” will be a lot stronger, allowing the Pasport to detect low viral loads, such as after a meal or drink, he added.

To capture viral variants which may otherwise evade detection through testing, the researchers have another trick up their sleeve.

Apart from using an antibody placed at the test line to capture viral proteins, just like in conventional ART kits, additional ACE2 proteins are used to capture the virus. The ACE2 protein is the entry point for the coronavirus to infect human cells.