

On-the-spot coronavirus test within spitting distance

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A COVID-19 test that will provide results within minutes, easing the way for borders to reopen, is set to be manufactured in Australia for Australian use.

Mass testing that is fast, non-invasive and able to identify cases before people show symptoms holds the key to boosting COVID-19 detection,

improving contact tracing and managing disease outbreaks.

In an Australian first, UTS scientists have used novel optical technology to design a highly sensitive saliva test for the SARS-CoV-2 virus antigens, or viral protein fragments. The test can deliver a positive result in under 15 minutes.

The rapid antigen test collects saliva in a cartridge placed in an existing hand-held device, first developed by Perth company Alcolizer for illicit drug testing. Customized iStrip technology measures the viral load in the saliva sample, even at very low levels, and displays the result on the instrument's small screen. The device has GPS location technology and integration to cloud reporting tools to assist with contact tracing.

The test bypasses the time-consuming molecular amplification currently in use. With the quick turnaround of results and a cost of less than \$25 per test, it would allow testing rates to increase.

The iStrip technology is based on the pioneering work of UTS Professor Dayong Jin in using nanophotonic probes for disease diagnostics. This iStrip is sensitive enough to detect the presence of as little as a trillionth of a gram of SARS-CoV-2 viral protein.

In collaboration with long-standing industry partner Alcolizer, Professor Jin and his team have developed a prototype, with laboratory trials on live virus expected to begin within two months. Manufacture of iStrips and testing instruments would take place in Australia, at Alcolizer's fully automated robotic facility in Balcatta, Western Australia.

Almost all testing for COVID-19 in Australia—more than 8.1 million tests to date—has used the gold standard PCR ([polymerase chain reaction](#)) [test](#), where samples are analyzed in a laboratory over several hours. However, with the global pandemic not yet at its peak, rapid

antigen tests are attracting increasing attention.

Professor Jin said his team's goal is detection of the presence of SARS-CoV-2 viral protein when a person has yet to show symptoms but is highly infectious.

"A person with COVID-19 may be contagious 72 hours before starting to show symptoms. With the sensitivity of our optical technology, we aim to identify the viral protein in saliva from asymptomatic but already infectious patients. This would allow for much more effective contact tracing and rapid discovery of pockets of disease before it is transmitted to others. Currently, a PCR swab from the nose or throat is being processed in the lab over a day or more, meaning valuable time is lost in finding, testing and isolating those known contacts of people who are infected with the virus."

Professor Jin said currently available antigen tests are authorized for use only within the first seven days after the onset of symptoms.

"They are not sensitive enough to effectively screen people who are showing no signs of illness. They also produce a number of false negative results," he said.

"Short of a vaccine, our best hope for containing community transmission and returning to some sort of normal life lies in a fast, highly sensitive and accurate testing regime. We believe our technology will help to realize that ambition."

Provided by University of Technology, Sydney

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