Researchers develop two new rapid COVID-19 diagnostic tests

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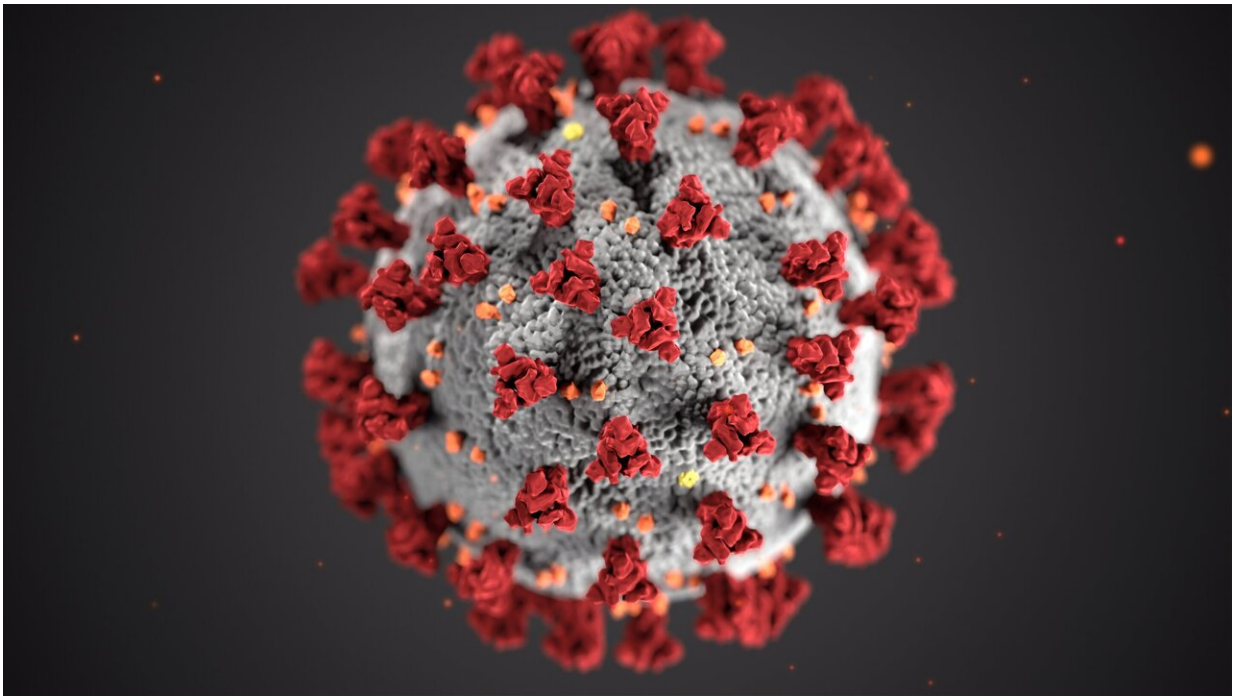

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University of Minnesota Medical School researchers have developed two new rapid diagnostic tests for COVID-19—one to detect COVID-19 variants and one to help differentiate with other illnesses that have COVID-19-like symptoms. The findings were recently published in the journal *Bioengineering*.

Although many people are hopeful about COVID-19 vaccines, widespread vaccine distribution isn't predicted to be available until several months from now. Until that happens, the ability to diagnose COVID-19 quickly and accurately is crucial to help minimize loss of life and continued spread of the virus.

The technology for both tests uses the cutting-edge CRISPR/Cas9 system. Using commercial reagents, they describe a Cas-9-based methodology for nucleic acid detection using lateral flow assays and fluorescence signal generation.

The first test is a rapid diagnostic test that can differentiate between COVID-19 variants. This test can be performed without specialized expertise or equipment. It uses technology similar to at-home pregnancy testing and produces results in about an hour.

The second, more sensitive test allows researchers to analyze the same sample simultaneously for COVID-19 (SARS-CoV-2), Influenza A and B and respiratory syncytial virus by measuring fluorescence. These viruses manifest with similar symptoms, so being able to detect and differentiate them adds a new diagnostic tool to slow the spread of COVID-19. This test also takes about an hour and could be easily scaled so many more tests can be performed. The necessary equipment is present in most diagnostics laboratories and many research laboratories.

"The approval of the SARS-CoV-2 vaccine is highly promising, but the time between first doses and population immunity may be months," said Mark J. Osborn, Ph.D., assistant professor of Pediatrics at the University of Minnesota Medical School and first author of this paper. "This testing platform can help bridge the gap between immunization and immunity."

In collaboration with the U of M's Institute of Engineering in Medicine and Jakub Tolar, MD, Ph.D., dean of the U of M Medical School,

Osborn and his team are now seeking to enhance sensitivity and real-world application of this test in support of rapidly detecting and identifying COVID-19 variants. In order to provide access to their new testing technology for healthcare providers and the public, the researchers are currently exploring ways to scale up and license their new diagnostics.

More information: Mark J. Osborn et al, CRISPR/Cas9-Based Lateral Flow and Fluorescence Diagnostics, *Bioengineering* (2021). DOI: 10.3390/bioengineering8020023

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