

Researchers adapt coronavirus test without scarce materials

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Jack Lipton, chair of the College of Human Medicine's Department of Translational Neuroscience. Credit: Michigan State University

Michigan State University researchers have validated a test to detect coronavirus that is more accurate than those currently available, and

could help address the national shortage of testing kits.

The method, however, first needs approval by the U.S. Food and Drug Administration before it can be widely offered to [test](#) patients suspected of having COVID-19, the respiratory disease caused by the virus.

The researchers were able to use different chemical reagents than those that have been in short supply for the standard test, and the Droplet Digital PCR machine is able to produce results in about a day.

"The new testing method already has been shown to be 500 times more sensitive than the standard [coronavirus](#) test," Jack Lipton, chair of the College of Human Medicine's Department of Translational Neuroscience, said. "That is significant, because it can reduce the number of false negative test results that would incorrectly diagnose a patient as free of the disease due to a low viral load, particularly among those who do not yet have symptoms."

After receiving expedited approval from MSU's Institutional Review Board, researchers were able to test university faculty and staff who volunteered, including one who previously had tested positive for COVID-19.

"We were able to see that the subject's viral load was off the chart," Lipton said.

The staff member is now recovering. A subsequent retest using the new method showed that the staff member's viral load had dropped significantly.

The new test is based on information that was posted on the website [medRxiv.org](#) by researchers in China. Joseph Patterson, a research assistant professor in the Department of Translational Neuroscience,

approached Lipton, confident that the team could adapt the test based on the study from China.

"We used the method that came out of China and adapted it to see if it would work for us, and it works," Lipton said. "If we can use our skill sets to help other people, this is what we can do."

Using a machine called a Droplet Digital PCR, the researchers tested [genetic material](#) in the laboratory before testing samples from the human volunteers. The machine amplifies the genetic material in a small sample and then calculates how much of the virus is in a patient's body.

The company that manufactures the machine, Bio-Rad Laboratories, has applied for FDA approval to offer the new test.

MSU's Department of Translational Neuroscience is not a clinical health provider and, therefore, is not authorized to offer the test to patients. The MSU researchers plan to make their findings available to other researchers with the goal of making their process for validating the test widely available.

"The more testing anyone can do in this crisis when lives are on the line, the better," Lipton said. "There's no money coming in for this. It's just the right thing to do."

The MSU test method was based on a study published on medRxiv.org titled "ddPCR: a more sensitive and accurate tool for SARS-CoV-2 detection in low viral load specimens."

More information: Tao Suo et al. ddPCR: a more sensitive and accurate tool for SARS-CoV-2 detection in low viral load specimens, *medRxiv* (2020). [DOI: 10.1101/2020.02.29.20029439](https://doi.org/10.1101/2020.02.29.20029439)

Provided by Michigan State University

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