Rapid screening test for omicron and other SARS-coV-2 variants

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A rapid test that detects all known COVID-19 variants, including the highly transmissible omicron variant, has been developed by researchers at Rutgers New Jersey Medical School.

The test, which can be performed at laboratories experienced in COVID-19 testing can quickly detect clinical samples that contain the SARS-CoV-2 virus with signature mutations for each known variant of concern—namely, the alpha, beta/gamma, delta and omicron variants. The test uses special probes called "sloppy molecular beacons" that perform particularly well at detecting mutations in organisms that mutate frequently. These probes work even if other mutations unexpectedly develop near a mutation of interest.

The Rutgers study appeared as a preprint publication this week in MedRxiv, which publishes research that is not yet peer reviewed. The study demonstrates that their approach is 100 percent sensitive and specific for identifying the correct variant when tested on clinical samples. The test can be used in a variety of instruments and assay formats.

The test was developed in the laboratory of David Alland, director of the Rutgers New Jersey Medical School Public Health Research Institute and the Center for COVID-19 Response and Pandemic Preparedness within the Rutgers Biomedical and Health Sciences Institute for Infectious and Inflammatory Diseases, and project leader Padmapriya Banada, working with Patricia Soteropoulos, Raquel Green and Deanna Streck.

"Our approach is unusually flexible in being able to detect unanticipated mutations," Alland said. "We had recently improved an older version of the assay, so that it could detect the Delta variant, but when omicron appeared, we suspected that it would be able to specifically identify this variant as well, and we are happy to find that our testing shows that we were correct."

The Rutgers Genomics Center Clinical Lab Team—Soteropoulos, Streck and James Dermody—are now working to obtain rapid approval from

the New Jersey Department of Health to use the new test on patients, where it could help determine the correct type of antibody therapy and potentially help identify patients at high risk for severe COVID-19.

To bolster the world's public health fight against COVID-19, the Rutgers team is releasing all of the information needed to create and run the test as well as supporting information on the preprint server MedRxiv, which will be updated periodically when needed.

More information: Padmapriya P Banada et al, An expanded high throughput RT-PCR assay to rapidly identify all known SARS-CoV-2 variants of concern using melting temperature coding (2022). DOI: 10.1101/2022.01.18.22269424

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