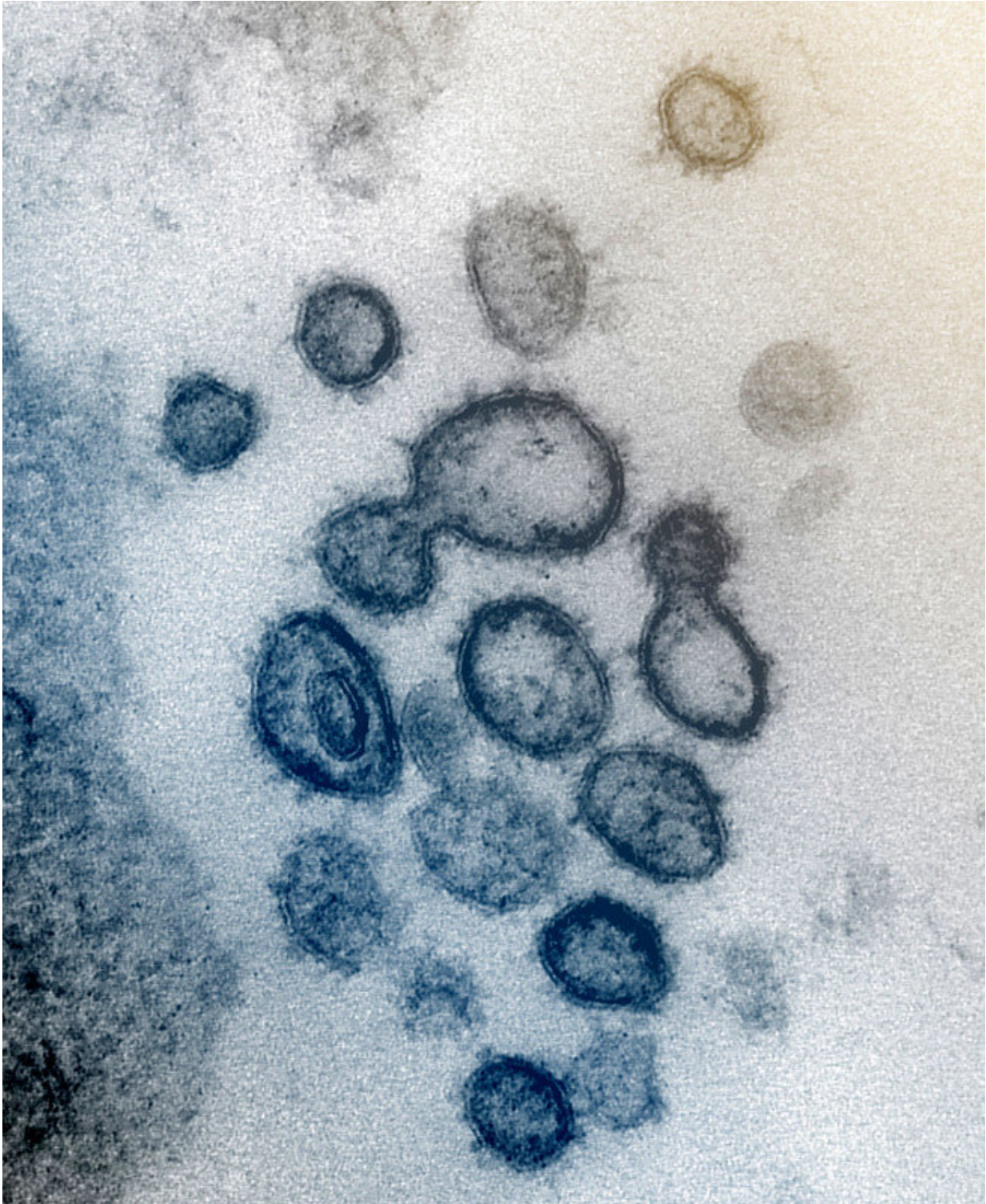


# **A simple and readily available saline solution can reliably transport COVID-19 samples to testing labs**

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This transmission electron microscope image shows SARS-CoV-2 -- also known as 2019-nCoV, the virus that causes COVID-19 -- isolated from a patient in the US. Virus particles are shown emerging from the surface of cells cultured in the

lab. The spikes on the outer edge of the virus particles give coronaviruses their name, crown-like. Credit: NIAID-RML

In a new peer-reviewed study appearing in *The Journal of Molecular Diagnostics*, investigators report that a simple salt solution commonly found in hospitals and clinical laboratories, phosphate buffered saline (PBS), can be used as a medium to reliably transport coronavirus-contaminated specimens to the testing laboratory for periods of up to 18 hours, which is often needed in busy clinical settings.

Clinical specimens suspected to contain viruses are usually shipped to testing laboratories in a complex mixture called virus transport medium (VTM). As the COVID-19 pandemic sweeps across the world, the availability of VTM has become severely limited, contributing to delays in diagnosis and rationing of diagnostic testing. Recognizing that SARS-CoV-2 viral RNA can remain stable on certain surfaces for up to 72 hours, scientists at Rutgers University hypothesized that PBS, which is inexpensive and commonly available in clinical settings, could be used instead.

"Necessity is the mother of invention," explains senior investigator Martin J. Blaser, MD, Department of Medicine, Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ, U.S.; and Center for Advanced Biotechnology and Medicine, Rutgers University, Piscataway, NJ, U.S.. "We were facing a problem about specimens reaching the lab intact due to the nationwide shortage of VTM, so we endeavored to test a widely available solution to see if it could help us. But first, we had to determine whether or not it worked."

Three experimental procedures were performed using discarded respiratory secretions from 16 confirmed COVID-19 patients. Swabs

were dropped into vials containing either PBS or VTM and transported to the laboratory for analysis using real-time PCR (RT-qPCR) testing to detect the presence of three specific SARS-CoV-2 virus genes in the samples. In the first procedure, eight samples from two subjects were harvested at the same time and transported in either VTM or PTS. The samples were processed immediately or after two hours at [room temperature](#). SARS-CoV-2 was detected in all samples at similar levels for each patient, demonstrating that results were consistent for samples obtained and stored in identical manners.

In a parallel experiment, samples were tested after remaining at room temperature in either PBS or VTM at points ranging from 0-18 hours. These experiments mimicked field conditions, in which specimens may remain in transport for longer periods. Researchers found that storage at room temperature had little effect on the values detected for the three SARS-CoV genes in either PBS or VTM and could be useful for labs that [test](#) for several SARS-CoV genes that have different processing times.

The researchers also examined samples transported in both PBS and VTM from an additional 12 patients with unknown viral loads. Again, they found the storage medium did not affect the detectability of the virus.

"That results for all three viral genes tested were strongly correlated across samples from multiple patients support the robustness of the entire testing pathway, including transport, establishing PBS as a dependable transport medium for use with clinical samples," notes Dr. Blaser. "Our contribution will allow for increased effective testing and transport from relatively long distances to testing labs, at lower cost."

The researchers note that expanded testing capacity would facilitate more widespread surveillance and containment of COVID-19 in



communities, allowing fewer restrictions in work, travel, and social distancing.

"New Jersey has been hit hard by COVID-19," adds co-lead investigator Jared Radbel, MD, Department of Medicine, Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ, U.S.; and Environmental and Occupational Health Sciences Institute, Rutgers University, Piscataway, NJ, U.S.. "Like other parts of the country, we have had delays in testing. Steps like using alternative materials to increase identification of infected individuals are needed to help clinicians respond to this pandemic illness."

**More information:** Jared Radbel et al. Detection of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Is Comparable in Clinical Samples Preserved in Saline or Viral Transport Medium, *The Journal of Molecular Diagnostics* (2020). [DOI: 10.1016/j.jmoldx.2020.04.209](https://doi.org/10.1016/j.jmoldx.2020.04.209)

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