

USU Biological Engineers Monitor Coronavirus in Sewage | College of Engineering

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July 16, 2020 — A recent statewide pilot study confirmed that coronavirus can be detected in sewage that enters wastewater treatment facilities. The findings may lead to new public health tools that help track infection rates and trends.



USU biological engineering professor Keith Roper helped lead an innovative study to determine if coronavirus could be detected in wastewater.

Utah State University professor of biological engineering Keith Roper and his students collaborated in the [study](#) with scientists from the University of Utah, Brigham Young University and the state's Division of Water Quality. From mid-April through May, the team collected samples of influent — water that enters a sewage treatment plant — at 10 wastewater treatment sites from Moab to Logan. SARS-CoV-2 virus ribonucleic acid (RNA) is frequently shed in the feces of infected individuals. Concentrations of virus RNA in sewage can be measured from samples collected at the inlet of sewage treatment plants. Of 171 wastewater samples, 64 percent tested positive for SARS-CoV-2 genetic material.

“Once we receive the wastewater sample, we disinfect it, remove contaminants and then extract genetic material,” said Roper. “Then we use a protocol published by the Centers for Disease Control to detect only the RNA from SARS-CoV-2.”



Biological engineering student Jake Accordino participated in a study to monitor coronavirus in sewage.

By comparing COVID-19 infection rates with data from the wastewater study, experts say it's possible to more accurately track infection trends. The virus was not detected in effluent — the treated and purified water that exits a treatment plant.

The researchers expanded their initial study and are now [collecting](#) wastewater samples to monitor SARS-CoV-2 RNA at 42 sewage treatment plants across Utah, representing about 80 percent of the state's population.

“Monitoring virus RNA in wastewater provides information about COVID-19 infection rates — including pre-clinical and possibly asymptomatic cases — and could help us anticipate trends and chances of transmission in our communities,” said Roper.



Biological engineering student Jacilyn Fielding (right) and summer intern Joel Dustin processed samples for the study at the NanoBioPhotonics Lab.

He emphasized that the research effort is a unique experience for USU students. Undergraduates in the Biological Engineering Department, including Jacilyn Fielding, Jake Accordino, Julissa van Renselaar and intern Joel Dustin were critical to the success of the research study. The students participated in processing the samples at USU's NanoBioPhotonics Lab. Biological engineering professor Ron Sims provided useful guidance about handling wastewater samples.

Given the success of the pilot study, the researchers submitted a [manuscript](#) to the prestigious Nature journal. A pre-print published online by Research Square discusses the results of the preliminary study and the team's ongoing efforts to better understand the prevalence and trends of COVID-19 infections.

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