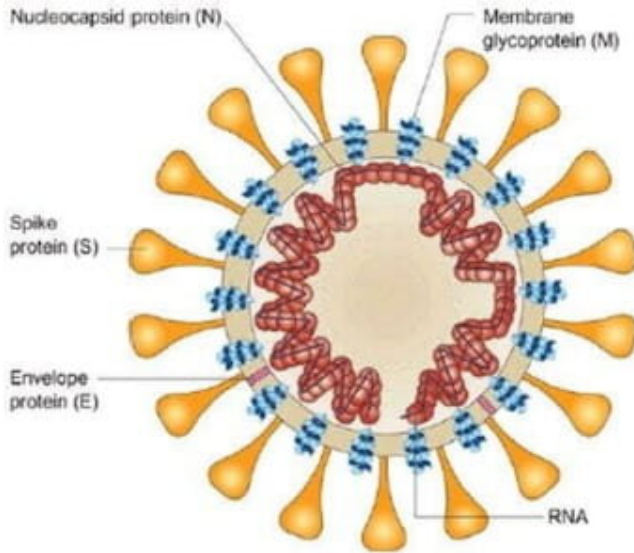


# Researchers look to 'trap and zap' coronavirus

24 April 2020



A schematic of the SARS-CoV-2 viral particle, which presents a number of targets for filtration technology being developed at Rice University. Courtesy of *Nature Medicine*, [nature.com/articles/nm1143/figures/3](https://www.nature.com/articles/nm1143/figures/3)

Rice University researchers plan to reconfigure their "trap and zap" wastewater-treatment technology to capture and deactivate the virus that causes COVID-19.

Rice civil and environmental engineer Pedro Alvarez and bioscientist Yizhi Jane Tao have won a National Science Foundation (NSF) RAPID grant to develop a "novel approach for selective adsorption and photocatalytic disinfection" of SARS-CoV-2.

Their chemical-free nanotechnology, introduced earlier this year as a way to kill bacterial "superbugs" and degrade their antibiotic resistance genes in wastewater, would employ graphitic carbon nitride customized at the [molecular level](#) to selectively absorb viruses and then disable them

by activating nearby catalysts with light.

Alvarez said the team aims to develop a system that is fast, efficient and reliable "under realistic scenarios."

"COVID-19 might be a dress rehearsal for even more lethal infectious diseases that are very difficult to control," said Alvarez, director of the Rice-based, NSF-backed Nanosystems Engineering Research Center for Nanotechnology-Enabled Water Treatment (NEWT). "We need to enhance the capacity and resiliency of multimedia treatment processes—especially air filtration and wastewater disinfection—to protect [public health](#)."

"SARS-CoV-2 has been found in air ducts, suggesting it could spread through a building's air conditioning system, and in stool, even from patients who have tested negative for COVID-19," he said. "That suggests it could reach [wastewater treatment plants](#), where it could survive for days."

While the researchers will test their work in the lab on similar but less-[virulent strains](#), they expect their trap-and-zap treatment approach will recognize coronaviruses that cause not only COVID-19 but also MERS and SARS, according to the project abstract.

Alvarez is the George R. Brown Professor of Civil and Environmental Engineering and a professor of chemistry and of chemical and biomolecular engineering. Tao is a professor of biosciences.

**More information:** Read the abstract at [www.nsf.gov/awardsearch/showAward ... historicalAwards=false](https://www.nsf.gov/awardsearch/showAward?award=RAPID&historicalAwards=false).

Provided by Rice University

APA citation: Researchers look to 'trap and zap' coronavirus (2020, April 24) retrieved 14 October 2022 from <https://medicalxpress.com/news/2020-04-zap-coronavirus.html>

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