Medical Xpress

# Rice engineer wins grant to study temperature and coronavirus

May 14 2020

Rice mechanical engineer Daniel Preston wins a National Science Foundation grant to study the effect of varying temperatures on the lifetime of the virus responsible for the COVID-19 pandemic. Credit: Rice University

Daniel Preston, an assistant professor of mechanical engineering at Rice's Brown School of Engineering, has received a National Science Foundation Rapid Response Research grant to study the effect of varying temperatures on the lifetime of the virus responsible for the

COVID-19 pandemic.

The project is titled "Thermal sterilization of medical PPE contaminated with SARS-CoV-2." Preston, the lead principal investigator, is collaborating with Chien-Te "Kent" Tseng, a professor of microbiology and immunology with the Centers for Biodefense and Emerging Diseases at the University of Texas Medical Branch.

"Kent has access to the SARS-CoV-2 virus in his laboratory and can provide experimental validation of our analytical model's predictions of the lifetime of the virus at various temperatures," Preston said.

He noted medical workers in the U.S. face a shortage of personal protective equipment (PPE), including masks, face shields and gowns. Doctors and nurses are forced to reuse protective gear designed to be discarded after a single use, thus increasing the risk of infection. Current guidelines for sterilization are limited.

"Dry heat sterilization can be performed almost anywhere, even using home ovens and rice cookers," Preston said. "Viruses inside crevices or within fabrics can easily be inactivated. Our project will provide evidence-based guidelines for the time required to achieve sterilization at a given temperature."

The project will also help predict the lifetime of viruses in various climates. That will become important in predicting the spread of the virus and the severity of the resurgence that may accompany the return of colder weather.

Preston summarized the project's chief objectives: to model the inactivation of SARS-CoV-2 due to high temperatures, factoring in the effects of humidity, acidity and surface material; to experimentally demonstrate sterilization of SARS-CoV-2 on medical PPE; and to

characterize thermal degradation of PPE during repeated thermal sterilization cycles.

An article describing the early results from Preston's work is under peer review. A preprint of the manuscript can be read at the ChemRxiv repository. Preston's co-authors are Zhen Liu, Rachel Shveda and Faye Yap, all Rice graduate students in his lab.

Provided by Rice University

Citation: Rice engineer wins grant to study temperature and coronavirus (2020, May 14) retrieved 10 May 2024 from https://medicalxpress.com/news/2020-05-rice-grant-temperature-coronavirus.html