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Continuously Active Surface Disinfectants May Provide Extra Barrier against Spread of Viruses, UArizona Researchers Find

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TUCSON, Ariz. – In the battle to slow or prevent the transmission of viruses, such as the novel coronavirus, continuously active disinfectants could provide a new line of defense, according to a recent University of Arizona study released on the health sciences preprint server MedRxiv.

COVID-19 models on a computer keyboard.

While disinfecting high-contact surfaces is an important practice to prevent the spread of pathogens, these surfaces can be easily re-contaminated after the use of conventional surface disinfectants. Alternatively, continuously active disinfectants work to actively kill microorganisms and provide continued protection over an extended period of time.

“During the course of respiratory illnesses such as COVID-19, aerosols released during sneezing and coughing contain infectious viruses that will eventually settle onto various surfaces,” said **Luisa Ikner, PhD**, associate research professor in the Department of Environmental Science in the UArizona College of Agriculture and Life Sciences and lead author of the study. “Factors including temperature, humidity and surface type can affect how long viruses such as SARS-CoV-2 will remain infectious after surface deposition.”

“The only tools we have currently in reducing the environmental spread of viruses via surfaces are hand sanitizer, hand washing and the disinfection of surfaces,” said **Charles “Chuck” Gerba, PhD**, a microbiologist and professor of environmental science in the College of Agriculture and Life Sciences professor of environmental and biostatistics in the Mel and Enid Zuckerman College of Public Health. “This technology creates a new barrier in controlling the spread of viruses in indoor environments.”

Dr. Gerba and his research team designed and conducted the study – which was funded by Allied BioScience, a company that manufactures antimicrobial surface coatings – to evaluate continuously active antimicrobial technology and its potential use against the transmission of viruses.

“We evaluated this technology by testing a modified antimicrobial coating against the human coronavirus 229E, which is one of the viruses that causes the common cold,” Dr. Gerba said. “Even two weeks after the coating was applied, it was capable of killing more than 99.9% of the coronaviruses within two hours.”

Human coronavirus 229E is similar in structure and genetics to SARS-CoV-2 but causes only mild respiratory symptoms. It can be safely used, therefore, as a model for SARS-CoV-2 to evaluate antiviral chemistries. The results from these experiments may provide new opportunities for controlling the environmental transmission of COVID-19.

Charles P. Gerba, PhD

"The standard practice of surface disinfection using liquid-based chemistries according to product label instructions can render many viruses – including the coronaviruses – noninfectious," Dr. Ikner said. "In contrast, high-touch surfaces treated with continuously active disinfectants are hostile environments to infectious viruses upon contact and demonstrate increasing effectiveness over time."

Continuously active disinfectant technology has been around for almost a decade but has been focused primarily on controlling hospital-acquired bacterial infections, such as invasive methicillin-resistant Staphylococcus aureus, or MRSA.

UArizona researchers from the Mel and Enid Zuckerman College of Public Health investigated the impact of antimicrobial surface coatings in reducing health care-associated infections in two urban hospitals. The results of that study were published in October in the journal *Clinical Infectious Diseases* and found a 36% reduction in hospital-acquired infections with the use of a continually active antimicrobial.

"As communities are reopening after weeks of stay-at-home restrictions, there is significant interest in minimizing surface contamination and the indirect spread of viruses," Dr. Gerba said.

Previous research on the environmental spread of viruses through contaminated surfaces modeled the spread of germs and the risk of infection in an office workplace. In that study, a contaminated push-plate door at the entrance of an office building led to the contamination of 51% of commonly touched surfaces and 38% of office workers' hands within just four hours. With the use of disinfecting wipes, environmental contamination was reduced to 5% of surfaces and 11% of workers' hands.

Luisa A. Ikner, PhD

"Antimicrobial coatings could provide an additional means of protection, reducing the spread of coronaviruses in indoor environments and public places where there is continuous contamination," Dr. Gerba said. "We're evaluating a number of products right now and believe it may be the next major breakthrough in environmental infection control."

*A version of this story appeared originally on the **UANews** website.*

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More information on the college's activities regarding the COVID-19 pandemic is at **this link**.

The UArizona Health Sciences COVID-19 Resources webpage can be found **here**.

For the latest on the University of Arizona response to the novel coronavirus, visit the university's **COVID-19** webpage.

NOTE: Photos available upon request.

About the University of Arizona Mel and Enid Zuckerman College of Public Health

Established in 2000, the Mel and Enid Zuckerman College of Public Health at the University of Arizona Health Sciences is the first nationally accredited college of public health in the Southwest. Today the college remains the only accredited college of public health in the state of Arizona, with campuses in Tucson and Phoenix. The college enrolls more than 1,100 students per year across degree programs at the bachelor's degree, master's degree and doctoral levels. Through research, education and community engagement, the UA Zuckerman College of Public Health continues to find solutions to public health problems in Arizona, the Southwest and globally. For more information: publichealth.arizona.edu (Follow us: Facebook | Twitter).

About the University of Arizona Health Sciences

The University of Arizona Health Sciences is the statewide leader in biomedical research and health professions training. UArizona Health Sciences includes the Colleges of Medicine (Tucson and Phoenix), Nursing, Pharmacy, and the Mel and Enid Zuckerman College of Public Health, with main campus locations in Tucson and the Phoenix Biomedical Campus in downtown Phoenix. From these vantage points, Health Sciences reaches across the state of Arizona, the greater Southwest and around the world to provide next-generation education, research and outreach. A major economic engine, Health Sciences employs nearly 5,000 people, has approximately 4,000 students and 900 faculty members, and garners $200 million in research grants and contracts annually. For more information: uahs.arizona.edu (Follow us: Facebook | Twitter | YouTube | LinkedIn | Instagram).

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