

Far-UVC light safely kills airborne coronaviruses

June 24 2020



This scanning electron microscope image shows SARS-CoV-2 (yellow)—also known as 2019-nCoV, the virus that causes COVID-19—isolated from a patient, emerging from the surface of cells (blue/pink) cultured in the lab. Credit: NIAID-RML

More than 99.9% of seasonal coronaviruses present in airborne droplets

were killed when exposed to a particular wavelength of ultraviolet light that is safe to use around humans, a new study at Columbia University Irving Medical Center has found.

"Based on our results, continuous airborne disinfection with far-UVC light at the current regulatory limit could greatly reduce the level of airborne [virus](#) in indoor environments occupied by people," says the study's lead author David Brenner, Ph.D., Higgins Professor of Radiation Biophysics at Columbia University Vagelos College of Physicians and Surgeons and director of the Center for Radiological Research at Columbia University Irving Medical Center.

The research was published today in *Scientific Reports*.

Conventional germicidal UVC light (254 nm wavelength) can be used to disinfect unoccupied spaces such as empty hospital rooms or empty subway cars, but direct exposure to these conventional UV lamps is not possible in occupied [public spaces](#), as this could be a health hazard.

To continuously and safely disinfect occupied indoor areas, researchers at Columbia University Irving Medical Center have been investigating far-UVC light (222 nm wavelength). Far-UVC light cannot penetrate the tear layer of the eye or the outer dead-cell layer of skin so it cannot reach or damage living cells in the body.

The researchers had previously shown that far-UVC light can safely kill airborne influenza viruses.

The new paper extends their research to seasonal coronaviruses, which are structurally similar to the SARS-CoV-2 virus that causes COVID-19.

In the study, the researchers used a misting device to aerosolize two common coronaviruses. The aerosols containing coronavirus were then

flowed through the air in front of a far-UVC lamp. After exposure to far-UVC light, the researchers tested to see how many of the viruses were still alive.

The researchers found that more than 99.9% of the exposed virus had been killed by a very low exposure to far-UVC light.

Based on their results, the researchers estimate that continuous exposure to far-UVC light at the current regulatory limit would kill 90% of airborne viruses in about 8 minutes, 95% in about 11 minutes, 99% in about 16 minutes, and 99.9% in about 25 minutes.

The sensitivity of the coronaviruses to far-UVC light suggests that it may be feasible and safe to use overhead far-UVC lamps in occupied indoor public places to markedly reduce the risk of person-to-person transmission of coronaviruses, as well as other viruses such as influenza.

Ongoing studies in SARS-CoV-2

In a separate ongoing study, the researchers are testing the efficacy of far-UVC light against airborne SARS-CoV-2. Preliminary data suggest that far-UVC light is just as effective at killing SARS-CoV-2.

"Far-UVC light doesn't really discriminate between coronavirus types, so we expected that it would kill SARS-CoV-2 in just the same way," Brenner says. "Since SARS-CoV-2 is largely spread via droplets and aerosols that are coughed and sneezed into the air it's important to have a tool that can safely inactivate the virus while it's in the air, particularly while people are around."

Brenner continues, "Because it's safe to use in occupied spaces like hospitals, buses, planes, trains, train stations, schools, restaurants, offices, theaters, gyms, and anywhere that people gather indoors, far-

UVC light could be used in combination with other measures, like wearing face masks and washing hands, to limit the transmission of SARS-CoV-2 and other viruses."

The paper is titled, "Far-UVC [light](#) (222-nm) efficiently and safely inactivates airborne coronaviruses."

More information: Manuela Buonanno et al, Far-UVC light (222 nm) efficiently and safely inactivates airborne human coronaviruses, *Scientific Reports* (2020). [DOI: 10.1038/s41598-020-67211-2](https://doi.org/10.1038/s41598-020-67211-2)

Provided by Columbia University Irving Medical Center

Citation: Far-UVC light safely kills airborne coronaviruses (2020, June 24) retrieved 11 May 2024 from <https://medicalxpress.com/news/2020-06-far-uvc-safely-airborne-coronaviruses.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.