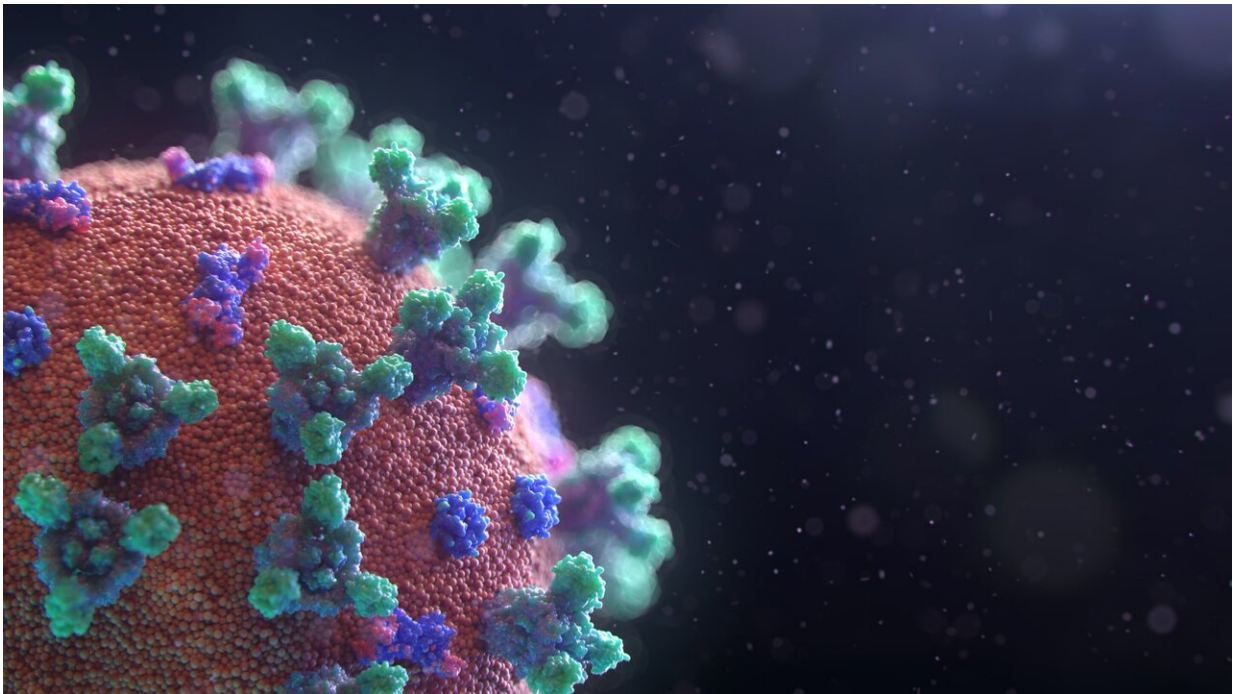


Airborne viruses can spread on dust, non-respiratory particles

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Credit: Unsplash/CC0 Public Domain

Influenza viruses can spread through the air on dust, fibers and other microscopic particles, according to new research from the University of California, Davis and the Icahn School of Medicine at Mt. Sinai. The findings, with obvious implications for coronavirus transmission as well as influenza, are published Aug. 18 in *Nature Communications*.

"It's really shocking to most virologists and epidemiologists that airborne dust, rather than expiratory droplets, can carry influenza virus capable of infecting animals," said Professor William Ristenpart of the UC Davis Department of Chemical Engineering, who helped lead the research. "The implicit assumption is always that airborne transmission occurs because of [respiratory droplets](#) emitted by coughing, sneezing, or talking. Transmission via dust opens up whole new areas of investigation and has [profound implications](#) for how we interpret laboratory experiments as well as epidemiological investigations of outbreaks."

Fomites and influenza virus

Influenza virus is thought to spread by several different routes, including in droplets exhaled from the [respiratory tract](#) or on secondary objects such as door handles or used tissues. These secondary objects are called fomites. Yet little is known about which routes are the most important. The answer may be different for different strains of influenza virus or for other respiratory viruses, including coronaviruses such as SARS-CoV2.

In the new study, UC Davis engineering graduate student Sima Asadi and Ristenpart teamed up with virologists led by Dr. Nicole Bouvier at Mt. Sinai to look at whether tiny, non-respiratory particles they call "aerosolized fomites" could carry influenza virus between [guinea pigs](#).

Using an automated particle sizer to count airborne particles, they found that uninfected guinea pigs give off spikes of up to 1,000 particles per second as they move around the cage. Particles given off by the animals' breathing were at a constant, much lower rate.

Immune guinea pigs with influenza virus painted on their fur could transmit the virus through the air to other, susceptible guinea pigs, showing that the virus did not have to come directly from the respiratory

tract to be infectious.

Finally, the researchers tested whether microscopic fibers from an inanimate object could carry infectious viruses. They treated paper facial tissues with [influenza virus](#), let them dry out, then crumpled them in front of the automated particle sizer. Crumpling the tissues released up to 900 particles per second in a size range that could be inhaled, they found. They were also able to infect cells from these particles released from the virus-contaminated paper tissues.

More information: Sima Asadi et al, Influenza A virus is transmissible via aerosolized fomites, *Nature Communications* (2020). DOI: [10.1038/s41467-020-17888-w](https://doi.org/10.1038/s41467-020-17888-w)

Provided by UC Davis

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