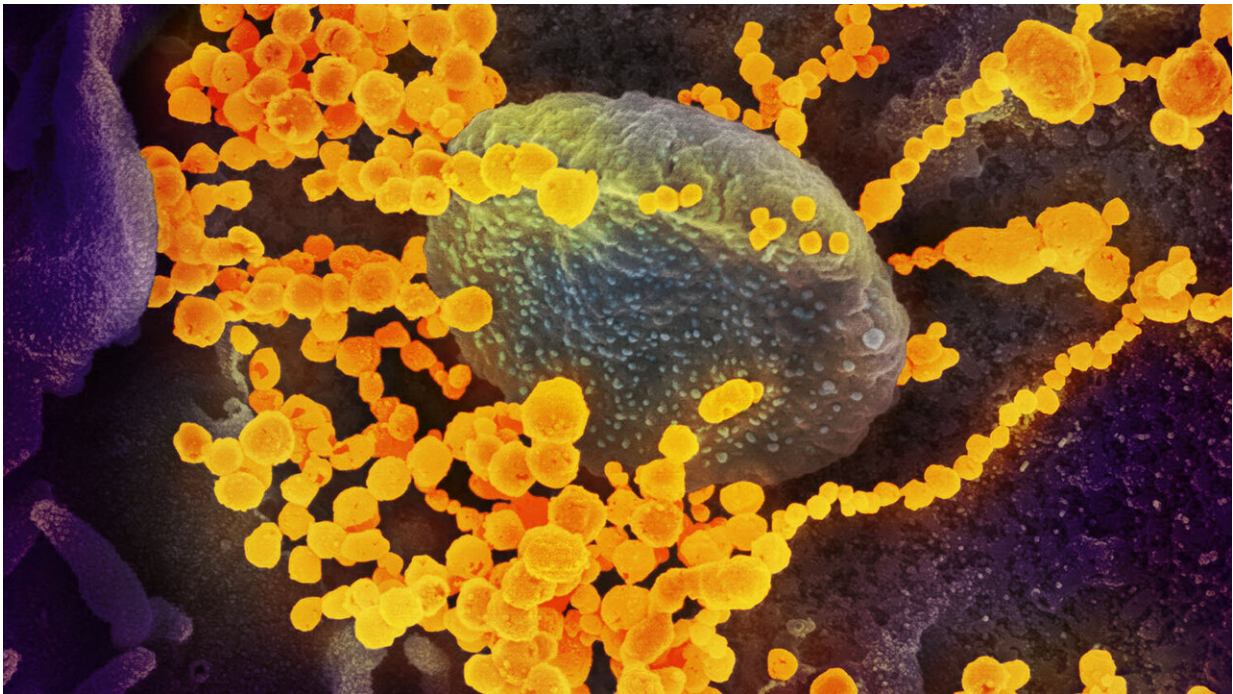


# Researchers demonstrate self-sterilizing polymers work against SARS-CoV-2

February 15 2021

---



This scanning electron microscope image shows SARS-CoV-2 (round gold objects) emerging from the surface of cells cultured in the lab. Credit: NIAID-RML

Researchers from North Carolina State University, Boston University and Kraton Corporation have demonstrated a family of self-sterilizing polymers that are effective at inactivating coronaviruses, including SARS-CoV-2—the virus that causes COVID-19. The work opens the

door to a suite of applications that could help to reduce the transmission of COVID-19 and other diseases.

"Our work here provides conclusive evidence that these materials, anionic polymers, can inactivate human coronaviruses quickly and efficiently," says Richard Spontak, co-author of a paper on the work accepted for publication in *Advanced Science*. Spontak is a Distinguished Professor of Chemical and Biomolecular Engineering and a professor of materials science and engineering at North Carolina State University.

"If we want to coat high-contact surfaces such as textiles, countertops or walls—it's possible," says Frank Scholle, co-author of the paper and an associate professor of biological sciences at NC State. "Virus inactivation will occur as long as there is sufficient humidity," adds Scholle, who is also director of NC State's Center for Advanced Virus Experimentation (CAVE).

When these anionic polymers absorb water, protons can travel through nanoscale channels to the surface, creating a highly acidic environment capable of inactivating viruses and killing bacteria and mold. The research team had previously demonstrated that several of the anionic polymers were effective against a range of pathogens, including methicillin-resistant *Staphylococcus aureus* (MRSA) and a strain of influenza.

"Based on what we've learned, we've been able to identify a fundamentally new inactivation mechanism and a family of polymers that expands the [health care sector](#)'s arsenal for fighting the spread of coronavirus," Spontak says.

In laboratory experiments, the researchers demonstrated that specific anionic polymers could fully inactivate SARS-CoV-2 in just five minutes, and fully inactivate a human coronavirus surrogate called

HCoV-229E in 20 minutes.

Kraton Corporation is in the process of evaluating applications for how some of these polymers might be used in a variety of settings.

"We are thankful for the opportunity to collaborate with NC State University and Boston University to address an important and urgent need for long-lasting antimicrobial performance," says Vijay Mhetar, Kraton's Chief Technology Officer. "Building upon this [scientific discovery](#), Kraton Corporation is actively seeking regulatory approvals and evaluating application uses in transportation, [health care](#), and building and infrastructure."

The paper, "Rapid and Repetitive Inactivation of SARS-CoV-2 and Human Coronavirus on Self-Disinfecting Anionic Polymers," was published online Feb. 9.

**More information:** Bharadwaja S.T. Peddinti et al. Rapid and Repetitive Inactivation of SARS-CoV-2 and Human Coronavirus on Self-Disinfecting Anionic Polymers, *Advanced Science* (2021). [DOI: 10.1002/advs.202003503](#)

Provided by North Carolina State University

Citation: Researchers demonstrate self-sterilizing polymers work against SARS-CoV-2 (2021, February 15) retrieved 27 June 2024 from <https://phys.org/news/2021-02-self-sterilizing-polymers-sars-cov-.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.