

Novel Rutgers COVID vaccine may provide long-lasting protection

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Novel Coronavirus SARS-CoV-2 Transmission electron micrograph of SARS-CoV-2 virus particles, isolated from a patient. Image captured and color-enhanced at the NIAID Integrated Research Facility (IRF) in Fort Detrick, Maryland. Credit: National Institute of Allergy and Infectious Diseases, NIH

Animal [studies](#) indicate that a new COVID-19 vaccine developed at Rutgers may provide more durable protection against SARS-CoV-2 and its emerging variants than existing vaccines.

"We need a better [vaccine](#), one that provides years of robust protection with fewer booster shots against a variety of SARS-CoV-2 strains. Our [data](#) suggest this [vaccine candidate](#) might be able to do that," said Stephen Anderson, associate professor of Molecular Biology and Biochemistry in SAS, resident member of the Rutgers Center for Advanced Biotechnology and Medicine and senior author of the paper in *Vaccines*.

Existing COVID vaccines often provide some protection against serious disease and death. However, these vaccines typically elicit temporary bursts of protective antibodies that rapidly wane, even after booster doses, leaving most individuals vulnerable to potentially dangerous repeat infections.

This new vaccine, dubbed MT-001, might provide longer-lasting protection against many COVID-19 varieties. "Thankfully, the current vaccines saved many lives, but they're still not optimal in some important respects," said Anderson. "They may not durably prevent people from getting sick."

Rutgers researchers developed MT-001 using technological approaches informed by an ambitious National Institutes of Health project that

aimed to create an antibody for every protein in the [human body](#).

Both FDA-approved RNA vaccines (and most other vaccines approved worldwide) use the entire COVID-19 spike protein as the trigger for the immune response. The new MT-001 vaccine candidate uses a unique section of that spike protein as its immunogen. This brings several advantages.

First, the spike protein section in this immunogen encompasses most of the targets for protective antibodies, including regions that are likely to remain unchanged in (and thus remain effective against) future variants. The data suggest that MT-001 (or its updated booster version) may elicit "broadly neutralizing" antibodies that confer protection against SARS-CoV-2 strain variants currently circulating in the human population and future variants that have not yet appeared.

Second, MT-001 was designed to be relatively straightforward to manufacture and distribute without special low-temperature handling. This could make vaccines based on the MT-001 prototype readily accessible from stockpiles, even in places where cold-storage infrastructure is lacking, should a coronavirus pandemic flare up again.

"In theory, it's possible that a booster shot of our variant-updated version of MT-001 could provide lifelong protection. The animal data indicate that it should, at the very least, provide protective antibody levels for at least a year or more, which is a vast improvement over today's vaccines, particularly given that many people are clearly unwilling to get a [booster](#) every few months," said Anderson. "Our goal is to enable people to put the fear of catching COVID behind them."

More information: Elliot Campbell et al, A SARS-CoV-2 Vaccine Designed for Manufacturability Results in Unexpected Potency and Non-Waning Humoral Response, *Vaccines* (2023). [DOI](#):

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