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## PROGRAMMING CELLS TO **PROTECT AGAINST COVID**

**FOCUS:** A novel intranasal vaccine alternative for COVID-19 treatment.

An adeno-associated viral (AAV) vector is a virus engineered to safely deliver DNA to specific target cells. Long before the COVID-19 pandemic, Dr. Wilson's lab had spent years researching how AAV could be effective against respiratory viruses. During the fateful month of February 2020, it was proposed that Dr. Wilson pivot this work toward a therapy for COVID.

Unlike current vaccines in use, which use a portion of the given virus to immunize patients, Dr. Wilson's approach begins directly with the given antibody—actually, a cloned characterized protein/antibody—which he can isolate and study until there is confidence it will be effective against the virus. This antibody is then incorporated into the gene for that particular antibody—not to elicit an immune response, but to program a person's own cells to express the antibody.

"A person doesn't even need an immune system for this method to work," Dr. Wilson says. "Because we've already isolated the antibody through other work, and we're asking non-immune cells to express the antibody—cells in the nose and mucosa, since that's where COVID is transmitted. This can be done via an aerosol spray into the nose, where the cells lining the passages take the gene up and express it. That way, when the virus comes in, it's blocked."

As there are reasons to believe that variants of SARS-CoV-2 will continue to emerge and threaten the efficacy of first-generation vaccine and monoclonal antibody therapeutics, Dr. Wilson's strategy could be an invaluable tool against any flu, and serve as a crucial pandemic countermeasure in coming years.

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