MICHAEL BARRY, PhD
Director, Vector and Vaccine Engineering Laboratory
Mayo Clinic—Rochester

"Our Harrington team really challenges us, helping us to do smart experiments and think about next steps."

STOPPING COVID
IN ITS TRACKS

FOCUS: Novel vaccine against COVID-19.

Typically, when COVID-19 infections first occur, there is only one or a few virus particles present. This would be the critical point at which to stop the infection before the virus expands exponentially. However, since COVID-19 vaccines are injected into the muscle, they miss the opportunity to generate a robust barrier of protection at the sites of entry—the nose and lungs.

Dr. Barry has hypothesized that intranasal vaccination would provide this needed barrier of protection, and has engineered a new type of vaccine called a single-cycle adenovirus, specifically for intra-nasal immunization.

"Generally, in a vaccine setting, the more protein you can make, the stronger the protection you'll get," Dr. Barry says. "The protein that triggers an immune response against COVID-19 is delivered into a cell using a carrier vaccine, or vector. Once it arrives, the vector produces the pathogen protein to generate the immune response against the threat. Creating a barrier at the earliest steps of an infection makes it much easier to stop a virus than after it amplifies to millions of SARS viruses spreading to the lungs."

This single-cycle vaccine is engineered to be substantially stronger than other adenovirus vaccines currently being used against COVID, in that it can produce 100 times more proteins for the immune system to detect, therefore provoking significantly stronger immune responses.

By making vaccines more potent, this platform technology could provide patients with greater protective benefit per dose, while enabling manufacturers to stretch vaccine supplies. Further, for the areas of the world experiencing vaccine shortages, this could unlock the potential to use fewer vaccines and inoculate more people.

Harrington Discovery Institute
University Hospitals | Cleveland, Ohio