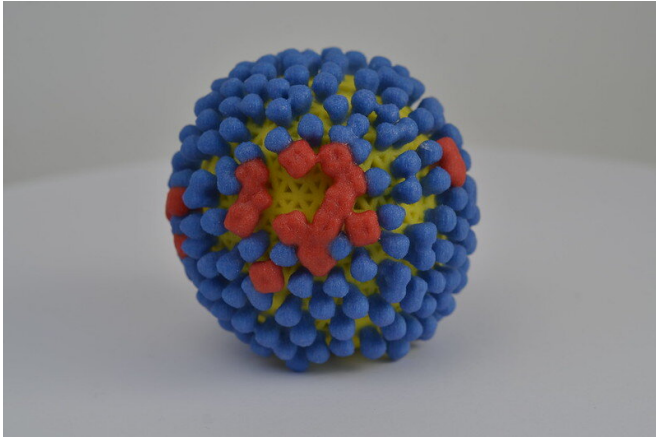


Intranasal influenza vaccine spurs strong immune response in Phase 1 study

3 February 2021



3-D print of influenza virus. The virus surface (yellow) is covered with proteins called hemagglutinin (blue) and neuraminidase (red) that enable the virus to enter and infect human cells. Credit: NIH

An experimental single-dose, intranasal influenza vaccine was safe and produced a durable immune response when tested in a Phase 1 study published in the *Journal of Clinical Investigation*. The investigational vaccine, called Ad4-H5-VTN, is a recombinant, replicating adenovirus vaccine designed to spur antibodies to hemagglutinin, a protein found on the surface of influenza viruses that attaches to human cells.

The investigational vaccine was developed by Emergent Biosolutions Inc., (Gaithersburg, Maryland). It was administered intranasally (28 study participants), as an oral capsule (10 participants) and via a tonsillar swab (25 participants) to healthy men and non-pregnant women ages 18 to 49 years.

The participants who received the vaccine intranasally or via tonsillar swab showed significantly higher H5-specific neutralizing [antibody levels](#) compared to the group receiving

the vaccine capsule orally. The participants who received the intranasal vaccine shed viral DNA for two-to-four weeks, but virus could be cultured for a median of only one day. Participants had evidence of H5-specific CD4+ and CD8+ T-cell responses. Additionally, volunteers who received the intranasal vaccine had high levels of serum neutralizing [antibodies](#) at 26 weeks after vaccination, and this level was unchanged at three to five years after a single intranasal dose of the vaccine. The duration of viral shedding correlated with a high magnitude of neutralizing antibody response at week 26. In addition, the intranasal vaccine induced a mucosal antibody response in the nose, mouth, and rectum.

The study authors speculate that replication-competent vector vaccines may have advantages over other types of vaccines because they can express [viral proteins](#) at higher levels and for longer durations. Additionally, this type of vaccine induces a mucosal [immune response](#) that is critical for limiting transmission of viruses that infect mucosal tissues.

The [vaccine](#) platform could be highly adaptable for use against other viruses including HIV and SARS-CoV-2, according to the authors.

More information: Kenta Matsuda et al, A replication competent adenovirus-vectored influenza vaccine induces durable systemic and mucosal immunity, *Journal of Clinical Investigation* (2021). [DOI: 10.1172/JCI1140794](https://doi.org/10.1172/JCI1140794)

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