

Vaccine for many common cold viruses achievable

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The vaccine tested by Emory/CHOA researchers does not cover all known rhinoviruses, but it does stimulate antibodies against 50 of them. Rhinoviruses are the predominant cause of the common cold and also exacerbate asthma. Credit: Thinkstock.

Scientists are making the case that a vaccine against rhinoviruses, the predominant cause of the common cold, is achievable.

The quest for a vaccine against rhinoviruses may have seemed quixotic, because there are more than 100 varieties circulating around the world. Even so, the immune system can handle the challenge, researchers from Emory University School of Medicine and Children's Healthcare of Atlanta say.

Vaccines that combine dozens of varieties of rhinovirus at once are effective in stimulating antiviral antibodies in mice and monkeys, the researchers report in *Nature Communications*. The paper was also posted on [Biorxiv](#) before publication.

"We think that creating a vaccine for the common cold can be reduced to technical challenges related to manufacturing," says Martin Moore, PhD, associate professor of pediatrics at Emory University School of Medicine.

Rhinoviruses are the most common cause of the [common cold](#); other viruses such as [respiratory syncytial virus](#), [parainfluenza virus](#) and adenoviruses can cause them too. Rhinoviruses also exacerbate asthma attacks. Although they come in many varieties, rhinoviruses do not drift to the same degree that influenza viruses do, Moore says.

Researchers showed in the 1960s that it was possible to vaccinate people against one variety of rhinovirus and prevent them from getting sick when challenged with samples of the same virus. The trouble was the sheer diversity of rhinoviruses – or that's how it appeared at the time.

"It's surprising that nobody tried such a simple solution over the last 50 years. We just took 50 types of rhinovirus and mixed them together into our vaccine, and made sure we had enough of each one," Moore says. "If we make a vaccine with 50 or 100 variants, it's the same amount of total protein in a single dose of vaccine. The variants are like a bunch of slightly different Christmas ornaments, not really like 50 totally different

vaccines mixed."

A mixture of 25 types of inactivated rhinovirus can stimulate neutralizing antibodies against all 25 in mice, and a mixture of 50 types can do the same thing in [rhesus macaques](#). In this paper, antibodies generated in response to the [vaccine](#) were tested for their ability to prevent the virus from infecting human cells in culture. However, the vaccines were not tested for their ability to stop animals from getting sick.

"There are no good animal models of rhinovirus replication," Moore says. "The next step would be human challenge models with volunteers, which are feasible because the virus is not very pathogenic."

More information: Sujin Lee et al. A polyvalent inactivated rhinovirus vaccine is broadly immunogenic in rhesus macaques, *Nature Communications* (2016). [DOI: 10.1038/ncomms12838](https://doi.org/10.1038/ncomms12838)

Provided by Emory University

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