

Prime-boost H7N9 influenza vaccine concept promising in clinical trial

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In clinical trials, several candidate H7N9 pandemic influenza vaccines made from inactivated viruses have been shown to be safe and to generate an immune response. However, scientists believe for practical use, these potential vaccines would require multiple doses or the addition of adjuvants, which enhance the immune response. With hopes of making one dose of an inactivated H7N9 vaccine fully protective, scientists from the National Institute of Allergy and Infectious Diseases (NIAID) successfully tested a prime-boost concept in a small clinical trial. The 'primer' pandemic influenza vaccine—made from live but weakened virus—introduces the immune system to H7N9 influenza virus, and subsequent vaccination with the 'booster' inactivated virus vaccine recalls a more robust immune response.

H7N9 [influenza](#) emerged in spring 2013 in China, primarily affecting people who have close contact with poultry. Through Nov. 13, 2015, the World Health Organization has reported 681 confirmed cases with at least 275 deaths. H7N9 influenza has not been found in the United States.

[The study](#), which appears in *The Journal of Infectious Diseases*, included 65 volunteers, 48 aged 18-49 years and 17 aged 50-70 years. Studies of live [pandemic influenza](#) vaccines in the older group had not been done before and are important because that is the age group most susceptible to severe disease from H7N9 influenza. Clinical researchers at the University of Rochester administered the vaccines and monitored volunteers. MedImmune, a Maryland company, created the live

attenuated candidate H7N9 vaccine as part of a [cooperative research and development agreement with NIAID](#). The Biomedical Advanced Research and Development Authority of the Department of Health and Human Services also supported the study.

Scientists designed the H7N9 clinical study after similar trials with other pandemic influenza viruses. Volunteers received either one or two doses of the candidate live attenuated vaccine and then 12 weeks later received an inactivated H7N9 vaccine, manufactured by Sanofi Pasteur (Swiftwater, Pennsylvania). The live attenuated vaccine primer created strong immune memory in both age groups, regardless of whether volunteers received one or two doses. Both vaccines were well tolerated.

Whether the live-virus vaccine used alone would provide protection without the inactivated vaccine boost remains a question. Scientists do know, however, that live-attenuated [influenza vaccines](#) developed against H5N1, H7N7, and now H7N9 generate long-lasting immunity that is rapidly recalled by a dose of inactivated [vaccine](#).

More information: M. Sobhanie et al. Evaluation of the safety and immunogenicity of a candidate pandemic live attenuated influenza vaccine (pLAIIV) against H7N9 influenza. The *Journal of Infectious Diseases* [DOI: 10.1093/infdis/jiv526](#) (2015).

Provided by NIH/National Institute of Allergy and Infectious Diseases

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