

New steps toward a universal flu vaccine

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Researchers at Mt. Sinai School of Medicine have developed a novel influenza vaccine that could represent the next step towards a universal influenza vaccine eliminating the need for seasonal immunizations. They report their findings today in the inaugural issue of *mBio*, the first online, open-access journal published by the American Society for Microbiology.

"Current influenza vaccines are effective against only a narrow range of influenza virus strains. It is for this reason that new vaccines must be generated and administered each year. We now report progress toward the goal of an influenza virus vaccine which would protect against multiple strains," says Peter Palese, an author on the study.

The main reason the current seasonal vaccine is so strain-specific is that the antibodies it induces are targeted at the globular head of the hemagglutinin (HA) molecule on the surface of the influenza virus. This globular head is highly variable and constantly changing from strain to strain.

In this study the researchers constructed a vaccine using HA without its globular head. Mice immunized with the headless HA vaccine showed a broader, more robust [immune response](#) than mice immunized with full-length HA, and that immune response was enough to protect them against a lethal viral challenge.

"Our results suggest that the response induced by headless HA vaccines is sufficiently potent to warrant their further development toward a

universal influenza virus vaccine. Through further development and testing, we predict that a single immunization with a headless HA vaccine will offer effective protection through several influenza epidemics," says Palese.

In a related article, also appearing in the inaugural issue of *mBio*, Antonio Cassone of the Istituto Superiore di Sanità, Rome, Italy, and Rino Rappuoli of [Novartis](#) Vaccines and Diagnostics, Siena, Italy, comment on the research and movement in the future towards universal vaccines.

"Recent research demonstrating the possibility of protecting against all influenza A virus types or even phylogenetically distant pathogens with vaccines based on highly conserved peptide or saccharide sequences is changing our paradigm," they write. "Is [influenza](#) the only disease that warrants approaches for universal vaccines? Clearly it is not."

They go on to note that a universal pneumococcal vaccine is already being discussed, as well as one for HIV. Universal vaccine strategies could also be used to protect against antibiotic-resistant bacteria and fungi for which no [vaccine](#) is currently available.

"There is now hope, sustained by knowledge and technology, for the generation of broadly protective universal vaccines restricted to species or groups of closely related pathogens," they write.

Provided by American Society for Microbiology

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