Study suggests potential hurdle to universal flu vaccine development may be overcome

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In the quest for a universal influenza vaccine-one that elicits broadly neutralizing antibodies that can protect against most or all strains of flu virus-scientists have faced a sobering question: Does pre-existing immunity generated by prior exposure to influenza virus or vaccine hamper production of broadly neutralizing antibodies? If so, then a universal flu vaccine might work best (and perhaps only) in very young children who have had limited exposure to influenza viruses or vaccines.

Now, in studies using mice and ferrets, investigators from the Vaccine Research Center (VRC) at the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, have shown that broadly neutralizing influenza antibodies can indeed be elicited by a prime-boost vaccine regimen, even when the animals had pre-existing immunity to influenza.

The vaccine regimen consisted of a DNA vaccine prime followed by boosting with an inactivated seasonal vaccine. It did not matter if the pre-existing immunity was due to exposure to a flu virus or if it followed vaccination with standard seasonal influenza vaccine. Influenza-immune ferrets inoculated with the prime-boost regimen were protected against challenge with unmatched influenza virus strains.

If the same effect is found in studies in people, it might be possible to develop vaccines that give long-lasting flu protection to people of all ages, according to the researchers.

Several clinical trials to examine the ability of first-generation universal flu vaccines to generate broadly neutralizing antibodies are either under way or planned at the VRC.

More information: C-H Wei et al. Elicitation of broadly neutralizing influenza antibodies in animals with previous influenza exposure. *Science Translational Medicine* DOI: 10.1126/scitranslmed.3004273 (2012).

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