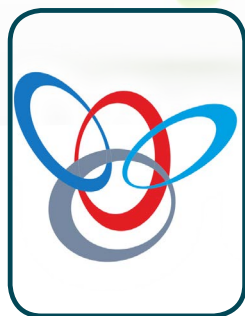


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Dat Nguyen

Dat Nguyen¹, Hsuan Liu¹, Jessica Resnick¹, Andrew Pekosz¹

¹W. Harry Feinstone Department of Molecular Microbiology and Immunology, The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA.

Point mutations on the Hemagglutinin of the 2015-2016 H1N1 Live Attenuated Influenza Vaccine strain and their effect on viral replication

The H1N1 component of the FluMist quadrivalent live attenuated influenza vaccine (QLAIV) for the 2015-2016 flu season had a lower replicative fitness in comparison to the other components in the formulation. As a result, the vaccine effectiveness of the 2015–16 A/H1N1pdm09 vaccine strain A/Bolivia/559/2013 (A/Bol-13) was low, leading to the loss of Advisory Committee on Immunization Practices recommendation for use. For the 2019-2020 flu season, A/Slovenia/2903/15 (A/Slov-15) was used as a replacement and showed a higher vaccine effectiveness. The two vaccine strains are different at only 4 amino acids on their Hemagglutinin (HA) proteins. We investigated the impact that these 4 residues by generating recombinant A/Bol-13 viruses that have these 4 amino acid positions changed to the ones present in A/Slov-15. On MDCK cells, at both 33 and 37 degrees Celsius, the reproduction rate & plaque-forming ability of the S84N and S162N mutant strains closely resemble A/Slov-15 while the I216T and P271Q mutants remain similar to A/Bol-13. Our data indicate that two of the four amino acid differences between the A/Slov-15 and A/Bol-13 HA proteins may have adverse effects on virus replication.