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Distinct priming effect of live attenuated versus inactivated influenza vaccines in repeated influenza vaccination

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The long term effectiveness of repeated influenza vaccination has been controversial. Recent studies suggested that the efficacy of influenza vaccination in the current season could be affected by the prior history of influenza vaccination. To help understand the mechanism underlying the effectiveness of repeated influenza vaccination, we investigated the B cell response to immunization with different types of influenza vaccines, focusing on the effect of prior influenza exposure on response to subsequent immunization with inactivated influenza vaccine (IIV). In young adults receiving repeated influenza vaccination in 2004 and 2005, the plasmablast and serum antibody responses after the 2005 vaccination were greater in those received live attenuated influenza vaccine (LAIV) than those who received IIV in the prior year of 2004. In young adults receiving their first dose of seasonal IIV containing the 2009 pandemic influenza A/H1N1 (A/H1N1pdm09) in 2010 or 2011, some individuals had pre-vaccination serum neutralizing antibody against A/H1N1pdm09, suggesting natural A/H1N1pdm09 infection during the 2009 pandemic. After the 2010 or 2011 IIV immunization, significant difference was not detected in the plasmablast response to A/H1N1pdm09 between the baseline sero-positive and sero-negative individuals. However, repeated immunization with the 2012 IIV that also contained A/H1N1pdm09 resulted in significantly reduced plasmablast response to A/H1N1pdm09. The serum antibody response was also significantly lower after the second dose in comparison to the first immunization. These findings indicate distinct priming effects of live influenza infection or LAIV versus IIV, suggesting that while repeated IIV immunization resulted in diminished B cell response, LAIV might help preserve the responsiveness of influenza-specific B cell repertoire in subsequent influenza vaccination.

Biography

Xiao-Song He is a Senior Research Scientist at VA Palo Alto Health Care System (affiliated with Stanford University School of Medicine) and an Adjunct Professor at University of California in Davis, USA. He received his Doctor of Science degree from Fudan University in Shanghai, and finished his Postdoctoral trainings in University of California in Davis and Stanford University. He has extensive experience in studying immune responses in viral infections and autoimmune diseases, with >70 publications in these fields. Currently his research focuses on B cell responses to influenza virus and the autoimmune liver disease primary biliary cirrhosis.

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