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Repeated influenza vaccination is a potential cause for reduced B cell response in the elderly

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The disease burden of annual influenza epidemics is especially significant among elderly individuals. Although vaccination provides protection, influenza vaccine needs to be reformulated yearly due to the frequent mutations of circulating strains. Currently annual influenza vaccination is recommended for individuals aged six months or older. The protective efficacy of the inactivated influenza vaccine (IIV) is significantly lower in the elderly than the younger adults but the cause of this age effect is not fully understood. To address this issue, we investigated the circulating plasmablast response to IIV and found that the number of vaccine-induced plasmablasts, or activated B cells, was lower in the elderly than young adults. In addition, the numbers of de novo somatic hypermutations in the immunoglobulin genes of influenza-specific plasmablasts were also lower in the elderly, resulting in an antibody response poorly adapted to the new vaccine antigens. To further explore the cause of the reduced B cell response, we followed a cohort of individuals who received annual influenza vaccination in four consecutive years and measured their plasmablast response after each vaccination. The plasmablast response declined with increased number of vaccination, whereas the avidity of plasmablast-derived polyclonal antibodies did not increase with repeated immunization of the same influenza vaccination in the elderly who have extensive exposure to influenza antigens during their livetime. Therefore it is importance to develop universal influenza vaccines that do not require annual vaccination.

Biography

Xiao-Song He has received his Doctorate degree from Fudan University, China and completed his Postdoctoral studies at Stanford University School of Medicine, USA. He is a Senior Research Scientist at VA Palo Alto Health Care System and Adjunct Professor at University of California in Davis, USA. He has published more than 60 original papers in the fields of Viral Immunology and Autoimmunity, and is a current member of the Editorial Advisory Board of The *Journal of Infectious Diseases*.

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