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Susceptibility of human antigen-specific CD4 T cells to HIV: Implications for HIV vaccine response

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Despite decades of effort, an efficacious prophylactic HIV vaccine remains unavailable. To date, a number of pre-clinical and clinical studies have been conducted testing the efficacy of candidate HIV/SIV vaccines delivered by different viral vectors (e.g. Ad5, CMV and others. Despite inducing comparable levels of T cell responses, immunization with these candidate vaccines led to distinct outcomes of vaccine efficacy from stringent viral control to increased risk of HIV acquisition. The immunologic basis for such profound difference in vaccine effects on HIV acquisition is not known. CD4 T cells play a central role in orchestrating host immune responses by interacting with B cells, CD8 T cells and other innate immune effectors. However, CD4 T cells represent major target by HIV for infection and depletion in vivo. In our group, we have established a novel system assessing HIV infection of different antigen-specific CD4 T cells to HIV in vitro and found that human antigen-specific CD4 T cells manifest remarkable difference in susceptibility to HIV with CMV-specific CD4 T cells being particularly resistant compared to bacterial (tetanus toxoid) and fungal (Candida) antigens. More recently, we identified that human Ad5-specific CD4 T cells are substantially more susceptible to HIV and are preferentially lost in HIV-infected individuals compared to CMV-specific CD4 T cells. Our findings suggest the importance of more thorough assessing the quality of vaccine-generated, vector and insert-specific CD4 T cells, and have important implications for testing new HIV/SIV vaccine antigens, vectors and adjuvants.

Biography

Haitao Hu has completed his PhD from the University of Pennsylvania School of Medicine in US prior to obtaining his MD in China. He joined the US Military HIV Research Program in 2010 and is currently a research Scientist and Investigator in the Program. He has worked on HIV pathogenesis and vaccine immunology for years and has strong expertise in the HIV/SIV vaccine field. He has published many papers as lead or corresponding author and has served as editorial board members and ad hoc reviewers for reputed journals.

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