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Synthetic DNA vaccines for difficult mucosal viruses including HIV

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DNA vaccines represent an important vaccine technology, which has specific conceptual advantages over many traditional vaccine platforms. However, in humans prior generations of this technology were poorly immunogenic. Through multiple improvements including synthetic plasmid optimization, genetic adjuvant technology further combined with enhanced EP delivery this platform now generates significant immune responses of relevance to human disease settings. These combined (synthetic) DNA approaches drive immune responses similar or superior to live viral vector protocols in diverse important model systems. We will review this important technology with a particular focus on clinical evaluation of both the immune responses as well as the possible impact of this technology For HIV. A specific application to treatment of HPV infection will be highlighted where we report that this synthetic approach can induce strong CTL in humans that can result in CD8+T cells increasing at the mucosal site of underlying HPV infection. We will also show that this immune phenotype can result in disease regression and immune clearance of infection in a double blind placebo controlled study. The implications of these studies for broader approaches to mucosal viral infections and to HIV vaccines and immune therapeutics will be discussed.

Biography

Jean D. Boyer completed her PhD at Rutgers University and her postdoctoral studies at the University of Pennsylvania, School of Medicine. She is currently an Associate Research Professor at the University of Pennsylvania and Senior Director of Analytical Sciences at Inovio Pharmaceuticals. Dr. Boyer has been working in the area of DNA vaccine development and immune assessment of vaccines for over 20 years and has published more than 90 papers in these areas. Her work has included studying the immunological responses to HIV-1 DNA based vaccines as well as investigating the impact of immunosuppression on vaccine immune responses.

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