

Oral presentation

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Increased immunogenicity of HIV vaccination with constant-current electroporation and molecular adjuvants in mice and rhesus macaques

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DNA vaccine studies in primates have yet to achieve the levels of immunogenicity predicted by mouse models. As a result, there have been numerous studies investigating various methods to increase the immunogenicity of DNA vaccines. Accordingly we have examined the ability of low trauma constant-current electroporation (CCEP) and molecular adjuvants to facilitate the immune responses induced by DNA vaccination. In mice we compared intramuscular (IM) injection alone with IM injection followed by CCEP DNA delivery. We observed increased cellular and humoral responses in electroporated mice using 20 fold less DNA than mice receiving DNA by IM injection alone. Further, we observed enhanced cytotoxic responses using molecular adjuvants in a skin electroporation model over electroporation alone. We subsequently performed a macaque study comparing immunizations of HIV gag and env DNA with or without CCEP. We found that CCEP additively enhanced cellular immune response and increased HIV gag antibody titers 5 fold in vaccinated macaques. Furthermore, CCEP can be improved with the addition of molecular adjuvants resulting in immune responses that mimic those induced by viral vectors. These results have important implications for HIV vaccines and immunotherapy.