Retrovirology

Poster presentation

P17-11. HIV DNA vaccine delivery in association with electroporation in the skin of nonhuman primates

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Background

We recently demonstrated that intradermal (ID) injection with electroporation (EP) of a new HIV DNA vaccine (auxo-GTU®MultiHIV) induced particularly strong and very long lasting specific T-cell responses (1044 ± 400 SFC per million PBMCs 3 years after vaccination) in macaques. Therefore we get interested to characterize the localization and expression of the auxo-GTU®MultiHIV vaccine as well as local involvement of immune cells at the sites of injection and in draining lymph nodes (LN).

Methods

Auxo-GTUMultiHIV DNA vaccine encoded consensus Gag, Nef, Rev, and Tat proteins from HIV clade B. In addition, this plasmid exploits the transcription enhancer and partioning capacity of the bovine papillomavirus (BPV) protein E2. ID injection was followed by EP with topical electrodes. Skin and LN biopsies were performed at different time points after ID injection and frozen in OCT media for immunochemistry analysis with fluorescence labelled mAbs. In vivo imaging was performed by ID injection and EP of the similar plasmid that expresses luciferase. Detection was done after injection of luciferin substrate.

Results

EP strongly increased DNA vaccine expression in the epidermis after ID injection. Peak of DNA expression was detected 24 hours after vaccination, and at day 8, was limited to the external layer of keratinocytes. The frequency of CD1a+ cells increased in the epidermis until day 8. Meanwhile CD1a+ cells were detected in the draining LN in association with antigen expression.

Conclusion

EP after ID injection of the auxo-GTU®MultiHIV DNA vaccine favoured plasmid expression in the epidermis. This may suggest the involvement of Langerhans cells in the subsequent generation and persistence of T cell responses. This new approach which targets antigen expression in the epidermis should be considered for T cell based prophylactic and therapeutic vaccine design.