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Poster presentation

P19-01. Pre-clinical immunogenicity of mosaic Asian AE/B HIV-1 DNA vaccine in mice

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Background

To cover the genetic diversity of HIV-1 among Asian countries, three mosaic HIV-1 DNA vaccines encompassing the gag gene derived from HIV-1 CRF01_AE and Asian HIV-1 subtype B were constructed and tested for immunogenicity in Balb/c mice.

Methods

Full-length gag sequences of 1.5 kb derived from 156 CRF01_AE and 72 Asian HIV-1 subtype B were computerized to generate 3 representative mosaic Asian HIV-1 *gag* genes. The mosaic *gag* genes were RNA-optimized and cloned into pCMVkan expression vector. Mice were immunized by intradermal (ID) and needle-free injector (NF) using 100 and 50 μg, respectively, of the 3 mosaic-gag mixtures. The vaccinations were performed on days 0, 14 and 28. An additional group received 5-million pfu vaccinia-AE boost on day 42. Mice were sacrificed on day 35 (DNA alone) and day 49 (DNA prime/vaccinia boost) and the immunogenicity was assessed by anti-p24 antibody and IFN-gamma ELISpot assays. Both HIV-1 AE- and B-peptide pools were used separately to stimulate splenocytes.

Results

All mice showed anti-p24 antibody responses of at least 1:10,000. For ELISpot assay, with the AE-peptide pool stimulation, the responses (median spots (range)) were 430 (291–643) and 953 (641–1206) for ID and NF groups, respectively. Whereas with the B-peptide pool stimulation, the responses were 560 (411–776) and 1151 (711–1352) for the ID and NF groups, respectively. The NF group showed statistically higher cellular immune responses testing either peptide pools ($p = 0.0043$ for AE & B, Mann-Whitney test). The prime/boost strategy using AE vaccinia virus gave much better responses of 1756(1062–2293) when stimulated with the AE-pool ($p = 0.0087$) but no increase in B-peptide responses (930 spots (679–1270)).

Conclusion

Our results suggest that the mosaic Asian HIV-1 DNA vaccine was immunogenic and could induce both humoral- and cell-mediated immune responses with appropriate immunization modification, i.e., using NF and prime/boost strategies.