Retrovirology

Poster presentation

P19-17. Construction of HIV-1 AE subtype gp140 DNA vaccine and immunogenicity evaluation

C Zhang*[1] and Y Wan[2]

Address: [1]Scientific Research Department, Shanghai Public Health Clinical Center, Shanghai, PR China and [2]Shanghai Public Health Clinical Center, Fudan University, Shanghai, PR China

* Corresponding author

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Background

According to a nationwide molecular epidemiology study, A/E recombinant form accounted for 15% prevalence in China. Thus, the preliminary object for HIV vaccine development in China is to obtain an efficacious vaccine targeting this clade. AE2F strain was isolated during the very early prevalence studies and, therefore, it might be considered as ancestor-like sequence in China. Here we designed a DNA vaccine and a recombinant Tiantan vaccinia vaccine (rTTV) encoding gp140 gene derived from HIV-1ae2f(AE) strain, and evaluated their expression *in vitro* and the immunogenicity of the DNA vaccine *in vivo*.

Methods

Humanized gene sequence encoding gp140 of HIV-1 AE2F was synthesized and cloned into the expression vector to generate DNA vaccine. The same sequence was cloned into shuttle plasmid and used to construct recombinant vaccinia virus by homologous recombination. Expression of the above two vaccines were determined with Western blotting assay. Mice were immunized by DNA vaccine and splenocytes were collected for IFN-γ based Elispot assay. A set of more than 200 peptides spanning the gp160 of A/E clade was used to formulate 4 peptide pools as stimulus.

Results

Western blotting demonstrated that the DNA vaccine and recombinant vaccinia vaccine can express HIV immunogen gp140 well *in vitro*. *In vivo*, the mice immunized with the DNA vaccine had a Env-specific T-cell immune response (2433 ± 1437 SFCs/10^6 splenocytes) compared to mock mice. The magnitude of T cell response stimulated with first peptide pool (Env1, 1625 ± 1048 SFCs/10^6 splenocytes) was significantly higher than those with the other three peptide pool (Env2, 71 ± 37 SFCs/10^6 splenocytes; Env3, 290 ± 213 SFCs/10^6 splenocytes; Env4, 447 ± 269 SFCs/10^6 splenocytes).

Conclusion

The two vaccines can express corresponding immunogen well and the DNA vaccine can elicit strong T cell response in mice. Based on the Elispot analysis, the predominant T cell epitope of A/E clade Env might be among the first two hundred amino acids.