OMICS Group Conferences
Accelerating Scientific Discovery

3rd World Congress on Virology

November 20-22, 2013 DoubleTree by Hilton Baltimore-BWI Airport, USA

Immunoprotection established by DNA vaccine against Hantavirus was stronger than traditional inactive vaccine and enhanced by a novel delivery method, electroporation

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Abstract

Our previous study, *DNA vaccine encoding Hantavirus Gn, targeted to the MHC class II compartment by LAMP, significantly elicits specific immune responses and induces immune protection against Hantavirus challenge in vivo*, showed that strong immune response established by HTNV Gn with LAMP as a chimera was HTNV specific and protective, suggesting that the pVAX-LAMP/Gn as a DNA vaccine has potential application on clinic for HTNV infection immunoprophylaxis. In the second series of trials, we introduced a novel pharmaceutical delivery system, electroporation to the novel DNA vaccine pVAX-LAMP/Gn. In order to observe whether the efficacy of pVAX-LAMP/Gn can be boosted by the novel delivery methods, we set nine groups of BALB/c mice to draw a comparison. They consisted of a conventional needle injection group with pVAX-LAMP/Gn, six groups of eletroporation system with pVAX-LAMP, pVAX-Gn and pVAX-LAMP/Gn(two doses respectively), an traditional inactive vaccine group and a blank control.

We analyzed specific antibody titers, neutralizing antibody valence, cytokine releasement of activated T lymphcyte and cytotoxicity of CTL and made a comparison among the results of each groups of mice. To see if the novel delivery was harmful to subjects we also did pothological observation of main organs and results remains negative. Finally, we drew conclusions that firstly, DNA vaccine encoded HTNV Gn with LAMP as a chimera could induced a much stronger immune efficacy than traditional inactive vaccine; and moreover, as a novel pharmaceutical delivery system, electoporation did enhanced the immunoprotection established by pVAX-LAMP/Gn. In a word, this study reaffirmed the potential application of DNA vaccine, pVAX-LAMP/Gn on clinic against HTNV infection.