IMMUNOGENICITY OF DNA VACCINE ENCODING Loa22 FUSED TO SINGLE CHAIN ANTIBODY TO Dec205 ScFv205)

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Abstract

Background: Leptospirosis is a worldwide zoonotic disease caused by pathogenic Leptospira species. Leptospirosis has become an important problem for veterinary and public health around the world. The infection is commonly transmitted by contact with urine from infected animal. Commercially available inactive-whole cell vaccine has limitations, such as short-term immunity, serovar-specific protection and several side effects. New vaccine strategies that elicit both humoral and cell-mediated immune responses are needed for the prevention of leptospirosis. The objective of this study is to improve immunogenicity of DNA vaccine encoding the outer membrane protein (OMP) Loa22 by fusing to single chain antibody directed against DEC205, for antigen targeting to dendritic cells (DCs).

Method: The Leptospiral outer membrane proteins (OMPs) have been used as vaccine candidates against leptospirosis. In our study, a new DNA vaccine encoding the OMP Loa22 fused to single chain antibody to the DEC205 receptor was constructed (ScFv205-Loa22) to target the antigen to dendritic cells. The specific binding of ScFv205 to murine DEC205 was confirm by flow cytometry using recombinant CHO cell line expressing mDEC205. In naïve BALB/C mice, ScFv205-Loa22 DNA vaccine was delivered by electroporation (EP) following homologous DNA prime-boost regimen at a 2-week interval. Two weeks after the second boost, serum and spleen from each mouse were collected to determine Loa22-specific antibody and specific T cell response.

Result: Targeting of Loa22 to dendritic cells through DEC205 did not significantly improve the production of Loa22-specific antibodies. However, mice immunized with ScFv205-Loa22 via EP significantly increased the IFN production in comparison to Loa22 DNA vaccine construct containing no ScFv205.

Conclusion: Our results suggested that the immunization of DNA vaccine encoding Loa22 fused to ScFv205 via EP significantly increased the IFN production in comparison to Loa22 DNA vaccine construct containing no ScFv205.

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