

The recombinant protein combination vaccine based on the fragment C of tetanus toxin and the cross-reacting material 197

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Abstract

Tetanus and diphtheria are important public health problems in many parts of the world. Since the diphtheria, tetanus toxoids and acellular pertussis vaccine (DTaP) was generally administered to children, the incidence of diphtheria and tetanus has dropped dramatically. However, with the increase of age, the anti-diphtheria and tetanus antibody in human body will decrease. DTaP is not suitable for boosting vaccine and the recombinant vaccine have more advantages than toxoid vaccines. Therefore, in this study, firstly, we expressed and purified the fragment C of tetanus toxin (TTc) and the cross-reacting material 197 (CRM197) of the diphtheria toxin mutant from *E. coli* BL21(DE3) expression system respectively. Moreover, the characteristics, immunogenicity of the purified protein were analyzed. Lastly, the recombinant TTc and CRM197 combination vaccine (RTCV) was constructed and antibody titers were detected. Our results displayed TTc induced Th2 immune response in mice while CRM197 could induce a mix Th1/Th2 immune response. RTCV was composed of 10 µg/mL TTc, 20 µg/mL CRM197 antigens and aluminum adjuvants (50 µg/mL). We found that the IgG and IgG1 antibody titers produced in mice were similar as those produced by DTaP, except the IgG2a antibody titers. The results above will provide technical support for the future combined recombinant protein vaccine to against diphtheria and tetanus.

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