

JOINT EVENT

31st Euro Global Summit and Expo on Vaccines & Vaccination
&4th World Congress and Exhibition on Antibiotics and Antibiotic Resistance
June 14-16, 2018 Barcelona, Spain

Study on vaccines of botulinum neurotoxin serotype A

Wei-Cai Zhang

Beijing Institute of Biotechnology, China

The botulinum neurotoxins (BoNT) produced by *Clostridium botulinum* are the most toxic known substances. The serotype A is the most poisonous and common species with extremely potential as a terrorist or biological warfare agent. In this study, recombinant sub-unit vaccines and replicon DNA vaccines against botulinum neurotoxin serotype A are investigated. A completely synthetic gene encoding the Hc domain of BoNT/A was constructed and expressed in *E. coli*, and full-sized and soluble product was produced. Mice given two vaccinations in 1 μ g dose of AHc were 100% protected against an intraperitoneal administration of 10⁶ 50% lethal doses (LD₅₀) of serotype A toxin. The immunogenicity of a plasmid DNA replicon vaccine encoding the Hc fragment of BoNT/A was investigated. Intramuscular injections of mice with the dendritic cells (DC)-targeted DNA vaccine stimulated more DCs to proliferate and mature than the non-targeted DNA vaccine in the spleen. The DC-targeted DNA vaccine could recruit a large number of DCs and promote their proliferation and maturation at the site of inoculation, while the non-targeted DNA vaccine recruited fewer DCs. In addition, the DC-targeted DNA vaccine induced stronger AHc-specific humoral immune responses, lymphocyte proliferative responses and protective potency against BoNT/A in mice than did pVAX1-SAHc. Moreover, the DC-targeting DNA vaccine provided effective protection after only two inoculations. These results showed that the DC-targeted fusion DNA vaccine could generate strong immunity, indicating that recruiting mature DCs to the site of inoculation is helpful for priming and boosting immune responses. Thus, we propose that the strategy of targeting antigen to DCs *in vivo* via DEC205 can enhance effectively the potency of DNA vaccines against BoNTs or other pathogens in an animal model. These results showed that recombinant sub-unit vaccines and DNA vaccines could be good candidate vaccines for human use to protect against BoNT/A.

Biography

Wei-Cai Zhang is a Microbiologist, being engaged for long in research on development of antibodies and vaccines against botulinum neurotoxins and biosynthesis of vitamins and coenzymes such as ascorbic acid and pyrroloquinoline quinone.

drzhangwc@163.com

Notes: