



Heavy chain fragments of botulinum neurotoxin serotypes A and B are being developed as a bivalent vaccine for botulism.

Formulation of botulinum neurotoxin heavy chain fragments for vaccine development: mechanisms of adsorption to an aluminum-containing adjuvant.

Depaz, RA, Henderson, I and Advant, SJ (2005). Formulation of botulinum neurotoxin heavy chain fragments for vaccine development: mechanisms of adsorption to an aluminum-containing adjuvant. *Vaccine* 23(31): 4029-4035

Abstract

Heavy chain fragments of botulinum neurotoxin serotypes A and B are being developed as a bivalent vaccine for botulism. To potentiate the immune response, an aluminum containing adjuvant will be formulated with the two antigens. The adsorption mechanisms of each antigen to aluminum phosphate and aluminum hydroxide adjuvants were studied. The adsorption of the serotype A antigen to each adjuvant, and the serotype B antigen to aluminum phosphate adjuvant, is dependent on electrostatic attractive forces. The serotype A antigen is basic, and pretreatment with phosphate anions is required for favorable adsorption conditions to aluminum hydroxide adjuvant. In contrast, the serotype B antigen displays a high affinity to aluminum hydroxide adjuvant even when the two species possess the same charge. It is proposed that the serotype B antigen is adsorbed to aluminum hydroxide adjuvant by a ligand exchange mechanism.

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Updated July 22, 2008