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DNA vaccine study against botulinum neurotoxin serotype E

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Botulinum neurotoxins (BoNTs) produced by *Clostridium botulinum* are the most toxic substance known and act by preventing the release of the neurotransmitter acetylcholine at the neuromuscular junction. Because of their high lethality, BoNTs are classified as category A agents by the Centers for Disease Control (CDC). Currently, there are no vaccines available to protect against BoNTs, so the rapid development of a safe and effective vaccine against BoNTs is important. DNA-based vaccines have recently drawn great attention because they can be developed quickly and can be applied in mass vaccination strategies to prevent outbreaks of disease. We studied the immunogenic and protective efficacy of a DNA vaccine delivered via the intradermal route, encoding a carboxyl-terminal fragment of the BoNT serotype E heavy chain. We synthesized gene fragment encoding non-toxic BoNTs heavy chain receptor (HCR) fragment as antigens using most frequently occurring codon in humans to code for each amino acid and inserted the synthetic genes in DNA vaccine plasmids (IgM-HCR). The antibodies against HCR were produced in Balb/c mice vaccinated with IgM-HCR via intradermal routes using *in vivo* electroporation. This IgM-HCR induced robust cellular and humoral BoNT/E-specific immune responses and completely protected mice against lethal challenge with BoNT/E toxin. These results indicated that DNA vaccines could be further developed as safe and effective candidates for vaccines against BoNT-E.

Biography

Wonrak Son has completed his M.D. at the age of 28 years from Korea University in Seoul. He is the researcher of ABION Cor., a bio- pharmaceutical drugs and companion diagnostics development organization. He has published more than 5 papers in reputed journals.

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