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Development of a Middle East respiratory syndrome *coronavirus* nano vaccine from Fc4 fused spike protein (eS770)

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Middle East respiratory syndrome *Coronavirus* (MERS-CoV) has emerged as a new pathogen that can transmit between humans as well as animals and humans, causing severe complications and high mortality rates. MERS-CoV continues to spread throughout the pandemic spread around the globe. MERS was first discovered at the end of 2012 and has caused more than 1,800 infections and 650 deaths. Increased MERS cases and no licensed MERS vaccines highlight the need for safe and effective vaccine development for MERS. The MERS-CoV spike (S) protein is responsible for receptor binding and virion entry into the cell and is highly immunogenic and induces neutralizing antibodies. In this study, we have expressed the eS1-770 MERS-CoV Spike protein fused with human Fc4 (eS1-770-Fc4) using baculovirus system and purified. Different doses of the eS1-770-Fc4 vaccine candidate were intramuscular injected into mice, and blood samples were collected every 10 days after immunization. The eS1-770-Fc immunized sera showed high titers of MERS-Cov antibodies and neutralizing activity against MERS-CoV. Only 1 ug of eS1-770-Fc4 elicited enough immunogenicity without adjuvant. The eS1-770-Fc could be a potential vaccine candidate.

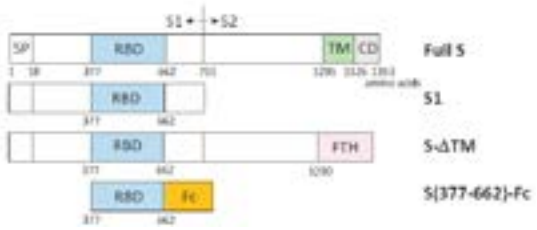

Figure: Schematic diagram of antigens used in MERS-CoV vaccine candidates. Full-length S protein is composed of S1 and S2 fragments. S1 contains the signal peptide (SP) and RBD, whereas S2 contains the transmembrane domain (TM) and cytoplasmic domain (CD). The peptide fused with human IgG Fc domain is designated S-Fc, differentiated by amino acid numbers at the start and endpoint in brackets.

Biography

Young Bong Kim received his Doctorate from Sogang University in Korea and trained at the NIAID/NIH in the United States. Since his appointment as a Professor at Konkuk University in 2003, he has been working on several vaccines against pathogenic viruses such as HIV, MERS-CoV and ZIKA virus.

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