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Immunogenicity of VLP forming baculoviral DNA vaccine

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An outbreak of influenza H1N1 in 2009, representing the first influenza pandemic of the 21st century, was transmitted to over a million individuals and claimed 18,449 lives. The current status in many countries is to prepare influenza vaccine using cell based or egg based killed vaccine. However, traditional influenza vaccine platforms have several limitations. To overcome these limitations, many researchers have tried various approaches to develop alternative production platforms. One of the alternative approach, we reported the efficacy of influenza HA vaccination using a baculoviral DNA vaccine (AcHERV-HA). However, the immune response elicited by the AcHERV-HA vaccine, which only targets the HA antigen, was lower than that of the commercial killed vaccine. To overcome the limitations of this previous vaccine, we constructed a human endogenous retrovirus (HERV) envelope coated, baculovirus based, virus like-particle (VLP) forming DNA vaccine (termed AcHERV-VLP) against pandemic influenza A/California/04/2009 (pH1N1). BALB/c mice immunized with AcHERV-VLP (1×10^7 FFU AcHERV-VLP, i.m.) and compared with mice immunized with the killed vaccine or mice immunized with AcHERV-HA. As a result, AcHERV-VLP immunization produced a greater humoral immune response and exhibited neutralizing activity with an intra-subgroup H1 strain (PR8), elicited neutralizing antibody production, a high level of interferon- γ secretion in splenocytes and diminished virus shedding in the Lung after challenge with a lethal dose of influenza virus. In conclusion, VLP-forming baculovirus DNA vaccine could be a potential vaccine candidate capable of efficiently delivering DNA to the vaccine and VLP forming DNA eliciting stronger immunogenicity than egg based killed vaccines.

Biography

Young Bong Kim has completed his PhD from Sogang University in Korea and Postdoctoral studies from NIAID, NIH, USA. He is the Director of Institute of Global Infectious Disease Control at Konkuk University. He has published more than 60 papers in reputed journals.

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