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Investigation to the serodiagnosis of zika and chikungunya virus using peptides comprising linear B-cell epitopes

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Zika virus (ZIKV) and chikungunya virus (CHIKV) are recently a re-emerging mosquito-borne Flavivirus and arbovirus which caused epidemic outbreaks globally and poses a major threat to public health. Infection by ZIKV and CHIKV can be difficult to distinguish from infection by other Flaviviruses due to high sequence similarity, antibody cross-reactivity, and virus co-circulation in endemic areas. Linear B cell epitopes are ideal biomarkers for the serological diagnosis of infectious diseases. ZIKV NS1 or CHIKV E2 is an important antigenic protein that elicits protective antibody responses and can be used for the serological diagnosis of ZIKV or CHIKV infection. In this study, a total of 33 peptides consisting of 15-30 ZIKV NS1 and 30 peptides consisting of 15 CHIKV E2 amino acid peptides were generated from consensus alignment of different virus's amino acid sequences. To investigate their diagnostic potential, we have tested different human serum samples (ZIKV, CHIKV, or Dengue virus; DENV infected, non-infected sera) by enzyme linked immunosorbent assay (ELISA) to detect specific IgG. We analyzed sensitivity and specificity for ZIKV or CHIKV infected human sera with each ZIKV NS1 or CHIKV E2 specific peptides. As a result, we found that each antigen based on peptides containing epitopes can improve ZIKV and CHIKV detection due to reduced cross-reactivity and higher sensitivity. These sensitive and specific peptide regions could be useful for the diagnosis of virus infection, discovery of vaccine candidates, evaluation of vaccine potency, and study of disease progression.

Biography

Hee-Jung Lee has completed her PhD from Konkuk University, Seoul, South Korea in 2010 and Postdoctoral studies in Dept. Animal Biotechnology and Institute of Global Disease Control, Konkuk University from 2010 to 2017. Since 2017, she has been working in Dept. Biomedical Science and Engineering, Konkuk University as an Associate Professor. She has published more than 20 SCI (E) papers as first author. She has also registered for 12 patents (6 of them are PCT patents). Her research interests are mainly focused on the development of vaccines, antiviral drugs and diagnosis against HPV, MERS-CoV, ZIKV, CHIKV, and *Henipavirus*.

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