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Flavivirus nonstructural protein 1-based recombinant vaccines

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The positive-sense RNA genome of mosquito-borne flaviviruses appears to be flexible in terms of accommodating extra insertions of heterologous antigens into their virus genes. With assistance from inclusion of designed flanking sequences derived from the junction between E-NS1 and NS2B-NS3, such insertions can be introduced into junction of E-NS1 or NS2B-NS3 to separate inserts from the *Flavivirus* polyprotein. In contrast, *Flavivirus* E and NS1 can directly house foreign epitopes to become fusion proteins without significantly disturbing normal virus replication. Herein, we illustrate that the newly-identified C-terminal of the core β-ladder domain in NS1 could be readily inserted into entities such as EV-71 epitopes, and the resulting NS1-epitope fusion proteins appeared to maintain normal virus replication, secretion ability, and multimeric formation from infected cells. Nonetheless, such an insertion attenuated the recombinant JEV in mice, despite having retained the brain replication ability observed in wild-type JEV. Mother dams immunized with recombinant JEV expressing EV71 epitope-NS1 fused proteins elicited neutralizing antibodies that protected the newborn mice against lethal EV71 challenge. Together, our results implied a potential application of using JEV NS1 as a viral carrier protein to express a heterologous epitope to stimulate dual/multiple protective immunity concurrently against several pathogens.

Biography

Ching-Len Liao is a Virologist from the University of Southern California, Keck School of Medicine, USA. He is currently the Investigator and Director of National Institute of Infectious Diseases and Vaccinology, National Health Research Institutes for Taiwan.

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