

ABSTRACT

JAPANESE ENCEPHALITIS VIRUS: UNIQUENESS OF IMMUNE RESPONSE, VACCINE DEVELOPMENT AND FUTURE CHALLENGES

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Japanese encephalitis virus (JEV) is a major seasonal health problem in many rural areas in India and other parts of Asia. Transmission of virus is through mosquito vectors biting followed by peripheral multiplication site and exposed to host immune response before it succeeds in invasion of CNS. Thus protection from viral infection is a complex interplay of fight for superiority by virus and the host.

Cell mediated immune response using transferred to non-immune 14 day mice and lethally challenged to study the protection. Results indicated that dominant immune response if of T helper (Th) 2 type. Th and neutralizing antibody inducing epitopes on JEV were identified by combination of immunological and Bioinformatics platforms. Chimeric peptides incorporating both Th and B cell epitopes could protect mice. These epitopes were further incorporated in polytope DNA construct with four chimeric peptides and induce protective immunity in mice. In addition, overcome the anergy development by traditional DNA vaccine plasmid than of CMV promoter using antigen specific cell promoter rather was also studied.

NIV carried out extensive studies on JE inactivated vaccines over the years. Studies were carried out mainly using CEC and Vero cells. Isolated of JEV from Kolar (821564) was extensively studied and thermostable mutant (821564 -XY) was selected and characterized genetically as well as antigenically. A commercial successfully produced purified, inactivated vaccine JENVAC is licensed is being successfully. Future challenges in terms of single dose vaccine with long lasting immunity, pig immunization vaccine as well newer related flavivirus are also important.