Feasibility of Using a Recombinant Baculovirus Vector to Express 26S Structural Proteins of Chikungunya Virus in Mammalian Cells

Szu-Cheng Kuo[1*], Yu-Ming Wang[1], Tzong-Yuan Wu[2]

[1.] Institute of Preventive Medicine, National Defense Medical Center, [2.] Department of Bioscience Technology, Chung Yuan Christian University

Background/Objective

Transduction of recombinant baculovirus bearing CMV promoter driving expression of target gene provides a convenient and effective way for protein expression in mammalian cell. Chikungunya virus (CHIKV), a mosquito-transmitted alphavirus, causes global pandemics of a persistent debilitating polyarthritis in humans. 26S proteins are playing important roles on viral infection and immune reactions. In this study, BacMam has been used for expression of CHIKV’s full-length structural protein in mammalian cell. VLPs formation and viral glycoproteins-induced cell-cell fusion were characterized.

Method

A recombinant baculovirus bearing CMV promoter driving CHIKV 26S cDNA has been generated. Expression of CHIKV’s proteins was been verified by IFA and wb. Co-fraction of viral structures by density-gradient ultracentrifugation demonstrates formation of VLPs. Cell-cell fusion assay was applied for the examining membrane fusion activity of CHIKV’s glycoproteins.

Result

A bundant CHIKV’s structural proteins were detected in Mammalian cell and its surface after BacMam-CHIKV-26S transduction. Co-fractionation of E2 and capsid proteins, and VLP-sized particle detected in mammalian cell transducted with BacMam-CHIKV-26S demonstrate CHIKV’s VLP formation. CHIKV glycoproteins-specific membrane fusion was performed in transducted mammalian cells.

Conclusion

BacMam system is a convenient DNA-delivering method for CHIKV’s full-length structural protein expression in mammalian cell.