

## Using Baculovirus Expression Vector System to Express Envelop Proteins of Chikungunya Virus in Insect Cells and Mammalian Cells

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**Abstract :** Currently, Chikungunya virus (CHIKV) transmitted to humans by Aedes mosquitoes has distributed from Africa to Southeast Asia, South America, and South Europe. However, little is known about the antigenic targets for immunity, and there are no licensed vaccines or specific antiviral treatments for the disease caused by CHIKV. Baculovirus has been recognized as a novel vaccine vector with attractive characteristic features of an optional vaccine delivery vehicle. This approach provides the safety and efficacy of CHIKV vaccine. In this study, bi-cistronic recombinant baculoviruses vAc-CMV-CHIKV26S-Rhir-EGFP and vAc-CMV-pH-CHIKV26S-Lir-EGFP were produced. Both recombinant baculovirus can express EGFP reporter gene in insect cells to facilitate the recombinant virus isolation and purification. Examination of vAc-CMV-CHIKV26S-Rhir-EGFP and vAc-CMV-pH-CHIKV26S-Lir-EGFP showed that this recombinant baculovirus could induce syncytium formation in insect cells. Unexpectedly, the immunofluorescence assay revealed the expression of E1 and E2 of CHIKV structural proteins in insect cells infected by vAc-CMV-CHIKV26S-Rhir-EGFP. This result may imply that the CMV promoter can induce the transcription of CHIKV26S in insect cells. There are also E1 and E2 expression in mammalian cells transduced by vAc-CMV-CHIKV26S-Rhir-EGFP and vAc-CMV-pH-CHIKV26S-Lir-EGFP. The expression of E1 and E2 proteins of insect and mammalian cells was validated again by Western blot analysis. The vector construction with dual tandem promoters, which is polyhedrin and CMV promoter, has higher expression of the E1 and E2 of CHIKV structural proteins than the vector construction with CMV promoter only. Most of the E1 and E2 proteins expressed in mammalian cells were glycosylated. In the future, the expression of structural proteins of CHIKV in mammalian cells is expected can form virus-like particle, so it could be used as a vaccine for chikungunya virus.

**Keywords :** chikungunya virus, virus-like particle, vaccines, baculovirus expression vector system

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