Assessment Study of Maruca vitrata Multiple Nucleopolyhedrovirus (MaviMNPV) in Non-host Gene Delivery System

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ABSTRACT

The Autographa californica multiple nucleopolyhedrovirus (AcMNPV) and Bombyx mori single nucleopolyhedrovirus (BmSNPV) were previously identified as gene-transfer vehicles for transient expression of recombinant proteins and designing environmentally benign biological insecticides in a wide range of insect or mammalian systems. Recently, a new baculovirus, Maruca vitrata multiple nucleopolyhedrovirus (MaviMNPV) and NTU-MV cell lines are established by professor Wang ’ Lab (National Taiwan University). The MaviMNPV genome was sequenced and analyzed in 2006. MaviMNPV is closely related to AcMNPV and BmSNPV by phylogenetic analyses. In this study we were focused on (1) MaviMNPV infected the non-host cells, (2) the genes expression profile of MaviMNPV infections, (3) assessmented the development of a novel baculovirus mammlian expression system. The NTU-MV56 and IPLB-Ld652Y cells were cultured with MaviMNPV at multiplicity of infection (MOI = 10), respectively. After infection, we compared the gene expression profile of virus, which is infection with the two cells. In addition, the MaviMNPV ie-1 gene expression level was increased, when high MOI MaviMNPV (up to 100 increased) infected in non-host cell (IPLB-Ld652Y, CL1-0, HEK293). The highest expression approximately 14-fold was found in HEK293, and HepG2. Immediate early gene 1 (ie-1) product, IE-1, is a strong transcriptional activator. The ability of MaviMNPV ie-1 promoter in mammalian cell lines were analysis using by western blot hybridizatine and luciferase assay system. We found that transfection of HEK293 cells with the MaviMNPV ie-1 promoter was more efficient than transfection in CL1-0 cells. MaviMNPV may be a useful vector for mammalian gene delivery application and the MaviMNPV ie-1 promoter also can activation in mammalian cells.

Keywords : baculovirus expression vector system、immediate early gene 1 (ie-1)、Maruca vitrata multiple nucleopolyhedrovirus (MaviMNPV)

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