Targeting Specific Mammalian Cell Types by Engineered Baculoviruses

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The baculovirus, Autographa californica multiple nucleopolyhedrovirus (AcMNPV) is able to infect a variety of mammalian cells, as well as insect cells. Baculovirus is replication-incompetent in mammalian cells but can express foreign genes under the control of insect promoters in insect cells. This makes baculovirus an attractive gene delivery vehicle. Glycoprotein gp64 from baculovirus, which is involved in non-specific receptor-mediated endocytosis and subsequent fusion events, makes baculovirus not suitable for in vivo study. We have constructed gp64-null bacmid carrying a ligand of interest, as well as a fusion molecule under the control of an insect promoter and a GFP reporter gene under the control of a mammalian promoter. The pseudotyped baculovirus made from this recombinant bacmid is able to display a fusion molecule and a ligand of interest on the surface of the virus. It can be used to target specific cell surface receptors with a ligand of interest while retaining the fusion ability to deliver the gene of interest into the desired cell.