MINIMAL BUDDING MACHINERY OF A VIAN METAPNEUMOVIRUS

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ABSTRACT

Enveloped viruses generally undergo the final stage of their replication, assembly and budding at cellular membranes. Gag protein of well-studied retroviruses, including HIV, contains all of the information needed for assembly and budding as virus-like-particles (VLPs) are efficiently released from cells when the Gag protein is expressed from the Gag-expression plasmid. As such Gag has been designated the minimal budding machinery for retroviruses. There has been controversy among other enveloped RNA viruses in terms of the budding machinery. The viral matrix protein (M) of some enveloped RNA viruses such as Ebola and Nipah viruses, like retrovirus Gag, is the minimal budding machinery, while M protein of influenza and some members of paramyxoviruses (SV5), expressed alone, is not sufficient to induce budding structure and form VLPs, suggesting that other viral components may have important roles along with M protein in the budding process. We investigated the minimal budding machinery for human metapneumovirus (a newly emerging paramyxovirus) by using avain metapenumovirus (aMPV) as a model system. Results of our experiments demonstrated that the M protein is the minimal budding machinery of aMPV. Furthermore, we found that Fusion (F) protein or Nucleocapsid protein (NC), expressed alone, is capable to secrete pelletable VLPs from cells. Work is currently underway to search for the cell protein network needed to cooperate with M1 protein to form VLPs, with a goal of elucidating the assembly and budding mechanism of metapenumovirus.