Measles Virus Infection of Primary Respiratory Epithelial Cells Derived from Rhesus Macaques
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ABSTRACT
Measles remains a leading vaccine-preventable cause of childhood mortality globally. Although a live-attenuated vaccine against measles virus (MV) is available, measles has been difficult to control. MV is a respiratory infection typically spread by aerosol droplets which target respiratory epithelial cells as initial sites of viral entry and replication. Primary tracheal and nasal epithelial cells (rmTECs/NECs) derived from rhesus macaques serve as an ideal system to study MV infection in the respiratory tract, because 1) rmTECs/NECs are polarized and differentiated to mimic respiratory epithelium in vivo and 2) rhesus macaques are the only susceptible host to MV infection other than humans. We have developed a method for culturing well-differentiated polarized rmTECs/NECs and shown that both WT and vaccine strains of MV successfully infect cells from both apical and basalateral surfaces. Though no significant difference in viral infection was observed with an increased duration of infection, viral titers maintained high levels throughout the time course suggesting successful infection of cells. Ed-MV and Bil-MV showed higher viral titers for cells infected apically. Both strains of MV maintained high viral titers over the time course.

BACKGROUND
Measles remains a leading vaccine-preventable cause of childhood mortality globally. Measles virus (MV) belongs to the Paramyxoviridae (family) and Morbillivirus (genus). It is an enveloped, single-stranded negative-sense RNA virus. Bilthoven (Bi)-MV is a wild-type virus and Edmonston-Zagreb (Ed-MV) is the strain used in the measles vaccine. CD46 and CD150 are the two known cellular receptors for MV infection. Measles is spread by the respiratory route, however, little is known regarding the tropism and replication of MV in the respiratory tract. Measles virus delivery through the respiratory route has been proposed and studied as a new vaccine strategy to achieve better vaccine coverage.

STUDY DESIGN

FUTURE DIRECTIONS

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