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Nipah virus infection of primary bronchial epithelial cells

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Nipah virus (NIV) is a highly pathogenic virus which infects many different mammalian species including pigs and humans. In pigs, NIV causes an acute respiratory infection and virus transmission via aerosols is very frequent. In contrast to pigs, the predominant clinical sign in human infections is severe encephalitis, and bronchial infections are not very prominent. Aim of this study was to establish a cell culture system that allows the characterization of the very efficient NIV infection in porcine respiratory epithelial cells. For this purpose, we isolated primary bronchial epithelial cells from porcine lung tissue (PBEC). The epithelia nature of the isolated PBECs was confirmed by immunostainings of epithelial marker proteins, such as cytokeratin and E-cadherin. In agreement with reports for other primary epithelial cells, TNFα stimulation induces an upregulation of the cell adhesion molecules ICAM-1 and VCAM-1. More importantly, PBECs readily expressed the NIV receptor ephrinB2 and could be efficiently infected by NIV. As well as PBEC grown under classical culture conditions, cells cultured under air-liquid interface conditions could also be stimulated by cytokines and efficiently supported NIV infection. We thus conclude that the isolated PBECs provide an appropriate model for further NIV infection studies in vitro.