ID der Kurzfassung : **65**

Tubulin-dependent apical transport of cellular NKA induced by influenza A virus infection.

Inhalt

Influenza A virus (IAV) infection may cause life-threatening conditions such as “Acute Lung Injury” (ALI) and “Acute Respiratory Distress Syndrome” (ARDS) characterized by lung edema formation, impaired gas exchange leading to death. Clearance of alveolar fluid is strongly dependent on active transport of sodium across alveolar epithelial cells. One of the main ion channels that establish an osmolytic gradient is Na+/K+-ATPase (NKA) located in the basolateral membrane. IAV-infection of primary alveolar epithelial cells (i) decreases NKA amount on the basolateral membrane of neighbouring, non-infected cells (Peteranderl C. et al., 2016) and (ii) induces NKA translocation to the apical site of infected cells. Our aim was to illuminate molecular mechanism underlying an apical presentation of NKA in IAV-infected cells.

By the use of Western blot (WB) analysis of biotynilated apical cell membrane proteins and by NKA quantification through “on cell western blot” analysis (OCWB) of cells infected with different IAV we could (i) quantitatively demonstrate NKA appearance in the apical membrane of Calu3 cells during late stages of IAV infection, which is (ii) induced by all tested IAVs. Through MEK, MLCK-, actin/microtubulin polymerization-, ROCK-, HDAC6- or kinesin-inhibition combined with OCWB / immunofluorescence analysis we could show that NKA misdistribution was blocked by interfering with the tubulin-associated transport, and its regulation. By analysis of changes in the FITC-dextran concentrations of apical and basal Calu3 culture media p.i. we could demonstrate that (iii) prevention of NKA translocation improved a vectorial water transport. This indicates that IAV-induced NKA misdistribution adds to edema formation.

Choose primary session

Virus host cell interaction

Choose secondary Session

Pathogenesis

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