allied academies

International Virology Conference

October 30-31, 2017 | Toronto, Canada

Inhibition of respiratory virus infection by cholesterol reducing agents

Shringkhala Bajimaya, Tsuyoshi Hayashi, Tünde Frankl, Peter Bryk, Brian Ward and **Toru Takimoto**
University of Rochester Medical Center, USA

Many enveloped viruses utilize cholesterol-rich lipid rafts at the plasma membrane for virus assembly and production. However, the functional role of cholesterol in virus formation and infectivity is unclear. In this study, we investigated the effects of FDA approved cholesterol-reducing agents on raft formation and the production of infectious parainfluenza virus (PIV), influenza A virus (IAV) and respiratory syncytial virus (RSV) in human airway cells. Depletion of cholesterol with the agents, especially when combined, significantly decreased production of all infectious viruses. Depletion of cellular cholesterol reduced cell surface accumulation of PIV glycoproteins and inhibited virus assembly and release. In contrast, depletion of cellular cholesterol did not decrease IAV and RSV surface glycoproteins accumulation, and virus particles were efficiently released from the cells. However, the released virus particles were less stable due to abnormal virion density and decreased cholesterol content in the viral membrane. Replenishing the virus released from the treated cells with cholesterol rescued virus stability and infectivity. Collectively, our findings suggest that cholesterol is critical for PIV assembly, and maintaining the stability of infectious IAV and RSV particles. Our data suggests that cholesterol is an attractive target for antiviral agents against various clinically important respiratory viruses.

e: shringkhala_bajimaya@urmc.rochester.edu