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Cell entry of avian reovirus follows a caveolin-1-mediated and dynamin-2-dependent endocytic pathway

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Very little is known about the mechanism of cell entry of avian reovirus (ARV). The aim of this study was to explore the mechanism of ARV entry and subsequent infection. Cholesterol mainly affected the early steps of the ARV life cycle, because the presence of cholesterol before and during viral adsorption greatly blocked ARV infectivity. Although we have demonstrated that ARV facilitating p38 MAPK is beneficial for virus replication, its mechanism remains unknown. Here, we show that ARV-induced phosphorylation of caveolin-1 (Tyr14), dynamin-2 expression, and Rac1 activation through activation of p38 MAPK and Src in the early stage of the virus life cycle is beneficial for virus entry and productive infection. The strong inhibition by dynasore, a specific inhibitor of dynamin-2, and depletion of endogenous caveolin-1 or dynamin-2 by siRNAs as well as the caveolin-1 colocalization study implicate caveolin-1-mediated and dynamin-2-dependent endocytosis as a significant avenue of ARV entry. By means of pharmacological inhibitors, dominant negative mutants, and siRNA of various cellular proteins and signaling molecules, phosphorylation of caveolin-1, dynamin-2 expression, and Rac1 activation were suppressed, suggesting that by orchestrating p38 MAPK, Src, and Rac1 signaling cascade in the target cells, ARV creates an appropriate intracellular environment facilitating virus entry and productive infection. Furthermore, disruption of microtubules, Rab5, or endosome acidification all inhibited ARV infection, suggesting that microtubules and small GTPase Rab5, which regulate transport to early endosome, are crucial for survival of ARV and that exposure of the virus to acidic pH is required for productive infection.

Biography

Wei-Ru Huang is a Ph.D. student at National Chung Hsing University. He is indulged in studyind the regulatory mechanism of viruses in the cell. He has published papers in the *journal of virology* and *journal of biological chemistry.*

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