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Bridges of Actin rich protrusions confer a novel route for extracellular virus transport

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Herpesviruses infect a vast majority of humans and demonstrate an extraordinary ability to spread to internal organs often traveling from cell to cell. Here we provide the first evidence that many divergent herpesviruses may have conserved an ability to travel exogenously between cells exploiting ubiquitously expressed heparan sulfate (HS) as transport receptors. Evidence presented here suggests formation of Actin Rich Protrusions (ARPs) as bridges for travel between cells by herpes simplex virus type-1, cytomegalovirus and human herpesvirus 8. This mode of transport is utilized by viruses to travel on the outer surfaces of ARPs and allows cells (including entry resistant cells) to exogenously transfer the viruses to neighboring cells. The formation of ARPs, which is induced upon viral exposure and the resultant viral transport require interaction between HS and an ultra conserved viral envelope glycoprotein, gB. The discovery of the extracellular viral transport marks a new concept in herpesvirus interactions with cells and adds a novel significance to HS in cellular transport and viral pathogenesis.

Biography

Dr. Tiwari earned his PhD in Biotechnology from Banaras Hindu University (India) and received extensive training as a Herpes Virologist from the University of Illinois at Chicago College of Medicine. He has published 30 peer reviewed papers in reputed journals and more than 60 abstracts in various national and international meetings in the field of Virology. Dr. Tiwari's major work includes the discovery of novel phagoctyic mode of HSV-1 entry and the significance of viral entry receptor. Dr. Tiwari studies have been funded by American Heart Association, Illinois Society to Prevent Blindness and Mid West Eye Bank Research Grant.