

Viral cell-to-cell spread: Conventional and non-conventional ways

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Abstract

A critical step in the life cycle of a virus is spread to a new target cell, which generally involves the release of new viral particles from the infected cell which can then initiate infection in the next target cell. While cell-free viral particles released into the extracellular environment are necessary for long distance spread, there are disadvantages to this mechanism. These include the presence of immune system components, the low success rate of infection by single particles, and the relative fragility of viral particles in the environment. Several mechanisms of direct cell-to-cell spread have been reported for animal viruses which would avoid the issues associated with cell-free particles. A number of viruses can utilize several different mechanisms of direct cell-to-cell spread, but our understanding of the differential usage by these pathogens is modest. Although the mechanisms of cell-to-cell spread differ among viruses, there is a common exploitation of key pathways and components of the cellular cytoskeleton. Remarkably, some of the viral mechanisms of cell-to-cell spread are surprisingly similar to those used by bacteria. Here we summarize the current knowledge of the conventional and non-conventional mechanisms of viral spread, the common methods used to detect viral spread, and the impact that these mechanisms can have on viral pathogenesis.

Author keywords

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