Fusion of viral membrane with host cell membrane

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Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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Literature references

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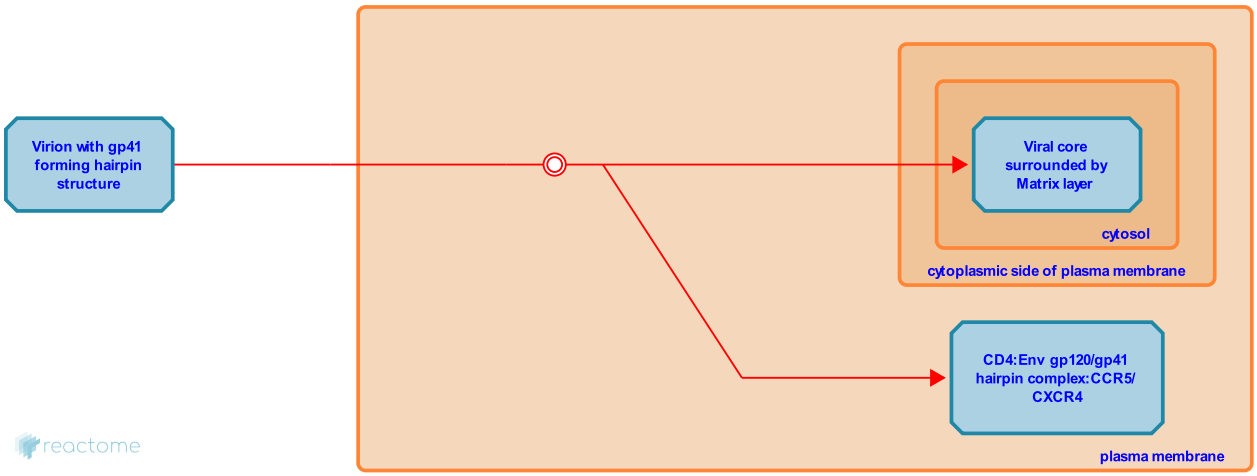
Stable identifier: R-HSA-164524

Type: dissociation

Compartments: cytosol, plasma membrane

Diseases: Human immunodeficiency virus infectious disease



With the transition of gp41 into the six-helix bundle, fusion of the viral and target cell membranes begins to take place. The specifics of fusion are not completely clear, but it is understood that fusion proceeds after insertion of the gp41 fusion peptide, which results in curvature of viral and target cell membranes. This results in a state of hemi-fusion, where only the outer lipid bilayers of each membrane are fused, whereas membrane leaflets that are distal with respect to the intermembrane gap remain separate at this stage. Hemi-fusion allows the exchange of lipids between the contacting leaflets, whereas the exchange of aqueous content between the virus and the cell remains blocked. The next step in fusion is the merger of the distal leaflets, leading to the formation of a nascent fusion pore, which leads to mixing of viral and cellular contents. Studies of fusion of Influenza virus suggested that multiple hairpin structures may form a narrow fusion pore which subsequently expands to a larger opening. In the case of HIV, this larger opening allows for passage of the Matrix-surrounded viral core out of the virus and into the host cell cytoplasm.

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Editions

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