

Insertion of gp41 fusion peptide into the target membrane

Bukrinsky, M., Gopinathrao, G., Morrow, MP., Reeves, J.

European Bioinformatics Institute, New York University Langone Medical Center, Ontario Institute for Cancer Research, Oregon Health and Science University.

The contents of this document may be freely copied and distributed in any media, provided the authors, plus the institutions, are credited, as stated under the terms of [Creative Commons Attribution 4.0 International \(CC BY 4.0\) License](#). For more information see our [license](#).

12/11/2024

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.

The development of Reactome is supported by grants from the US National Institutes of Health (P41 HG003751), University of Toronto (CFREF Medicine by Design), European Union (EU STRP, EMI-CD), and the European Molecular Biology Laboratory (EBI Industry program).

Literature references

Fabregat, A., Sidiropoulos, K., Viteri, G., Forner, O., Marin-Garcia, P., Arnau, V. et al. (2017). Reactome pathway analysis: a high-performance in-memory approach. *BMC bioinformatics*, 18, 142. [↗](#)

Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics*, 33, 3461-3467. [↗](#)

Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res*, 46, D649-D655. [↗](#)

Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology*, 14, e1005968. [↗](#)

Reactome database release: 90

This document contains 1 reaction ([see Table of Contents](#))

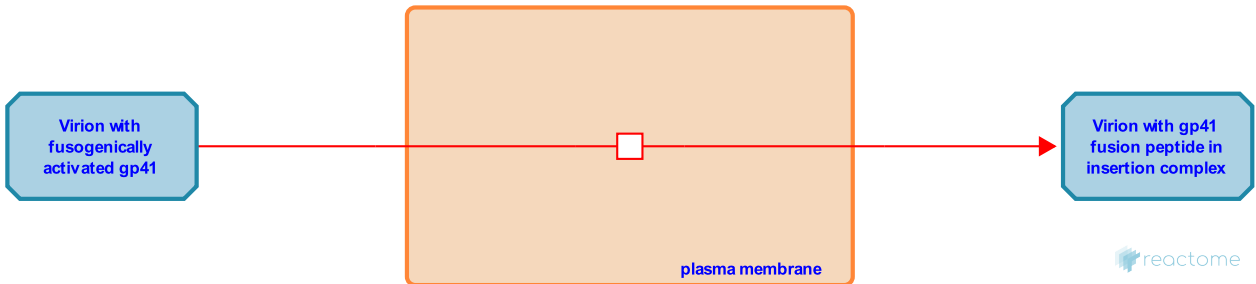
Insertion of gp41 fusion peptide into the target membrane ↗

Stable identifier: R-HSA-164521

Type: transition

Compartments: plasma membrane

Diseases: Human immunodeficiency virus infectious disease



Insertion of the N-terminal fusion peptide of the HIV gp41 protein is the first step in the fusion of viral and target cell membranes. Substitutions of polar amino acids at residues 2, 9, 15 and 26 of the N terminus of this peptide completely eliminated its ability to cause fusion, implicating these residues in gp41's role in insertion and fusion. Studies have also shown that mutations in a stretch of residues from 36-64(568 to 596 of ENV protein) caused gp41 to become partially or completely defective in mediating membrane fusion, suggesting that conformation of the peptide is important for proper insertion and fusion to occur.

Literature references

Jiang, S., Lin, K., Neurath, AR., Strick, N. (1993). Inhibition of HIV-1 infection by a fusion domain binding peptide from the HIV-1 envelope glycoprotein GP41. *Biochem Biophys Res Commun*, 195, 533-8. ↗

Oas, T., Matthews, T., Bolognesi, D., Wild, C., McDanal, C. (1992). A synthetic peptide inhibitor of human immunodeficiency virus replication: correlation between solution structure and viral inhibition. *Proc Natl Acad Sci U S A*, 89, 10537-41. ↗

Risser, R., Freed, EO., Myers, DJ. (1990). Characterization of the fusion domain of the human immunodeficiency virus type 1 envelope glycoprotein gp41. *Proc Natl Acad Sci U S A*, 87, 4650-4. ↗

Sodroski, J., Thali, M., Bergeron, L., Repke, H., Helseth, E., Cao, J. (1993). Effects of amino acid changes in the extra-cellular domain of the human immunodeficiency virus type 1 gp41 envelope glycoprotein. *J Virol*, 67, 2747-55. ↗

Editions

2006-02-17	Edited	Gopinathrao, G.
2006-03-08	Authored	Morrow, MP., Bukrinsky, M.
2006-06-12	Reviewed	Reeves, J.