Internalization of MHC II:Ii clathrin coated vesicle

Garapati, P V., Neefjes, J.

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

03/05/2024

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. ↗

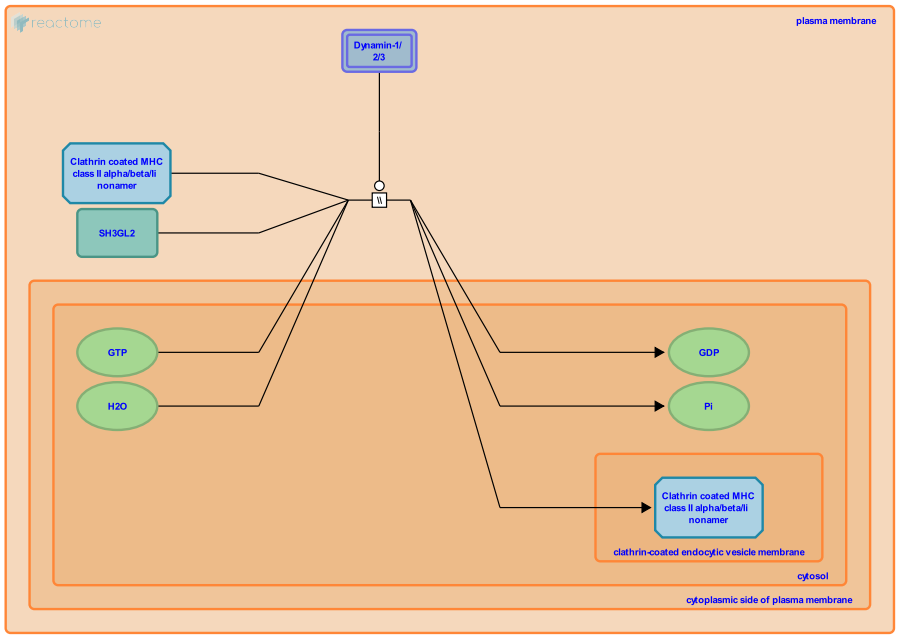
Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology, 14*, e1005968. ↗

Internalization of MHC II:Ii clathrin coated vesicle ↗

Stable identifier: R-HSA-2130725

Type: omitted

Compartments: plasma membrane, cytosol, clathrin-coated endocytic vesicle membrane



MHC II:Ii complexes are internalized in to the endocytic clathrin coated-pit. Dynamin, the GTPase involved in the scission of clathrin-coated vesicles from plasma membrane is observed to be involved in the effective endocytosis of MHC II:Ii complexes. Wang et al, demonstrated that overexpression of a dominant-negative mutant of the GTPase dynamin resulted in the cell surface accumulation of MHC II:Ii complex, supporting that endocytosis is required for delivery to antigen processing compartments (Wang et al, 1997). However, another study using the same dynamin mutant generated opposite conclusions (Davidson, 1999). This discrepancy may be caused by differences in experimental set-up and in the levels of expression of the dynamin mutant and MHC II chains (Dugast et al, 2005).

Literature references

Dousset, C., Toussaint, H., Benaroch, P., Dugast, M. (2005). AP2 clathrin adaptor complex, but not AP1, controls the access of the major histocompatibility complex (MHC) class II to endosomes. *J Biol Chem, 280*, 19656-64. ↗

Teletski, CL., Roche, PA., Long, EO., Stang, E., Bakke, O. (1993). Cell surface HLA-DR-invariant chain complexes are targeted to endosomes by rapid internalization. *Proc Natl Acad Sci U S A, 90*, 8581-5. ↗

Davidson, HW. (1999). Direct transport of newly synthesized HLA-DR from the trans-Golgi network to major histocompatibility complex class II containing compartments (MIICS) demonstrated using a novel tyrosine-sulfated chimera. *J Biol Chem, 274*, 27315-22. ↗

Peterson, PA., Karlsson, L., Wang, K. (1997). Decreased endosomal delivery of major histocompatibility complex class II-invariant chain complexes in dynamin-deficient cells. *J Biol Chem, 272*, 17055-60. ↗

Editions

2012-02-21	Authored, Edited	Garapati, P V.
2012-05-14	Reviewed	Neefjes, J.