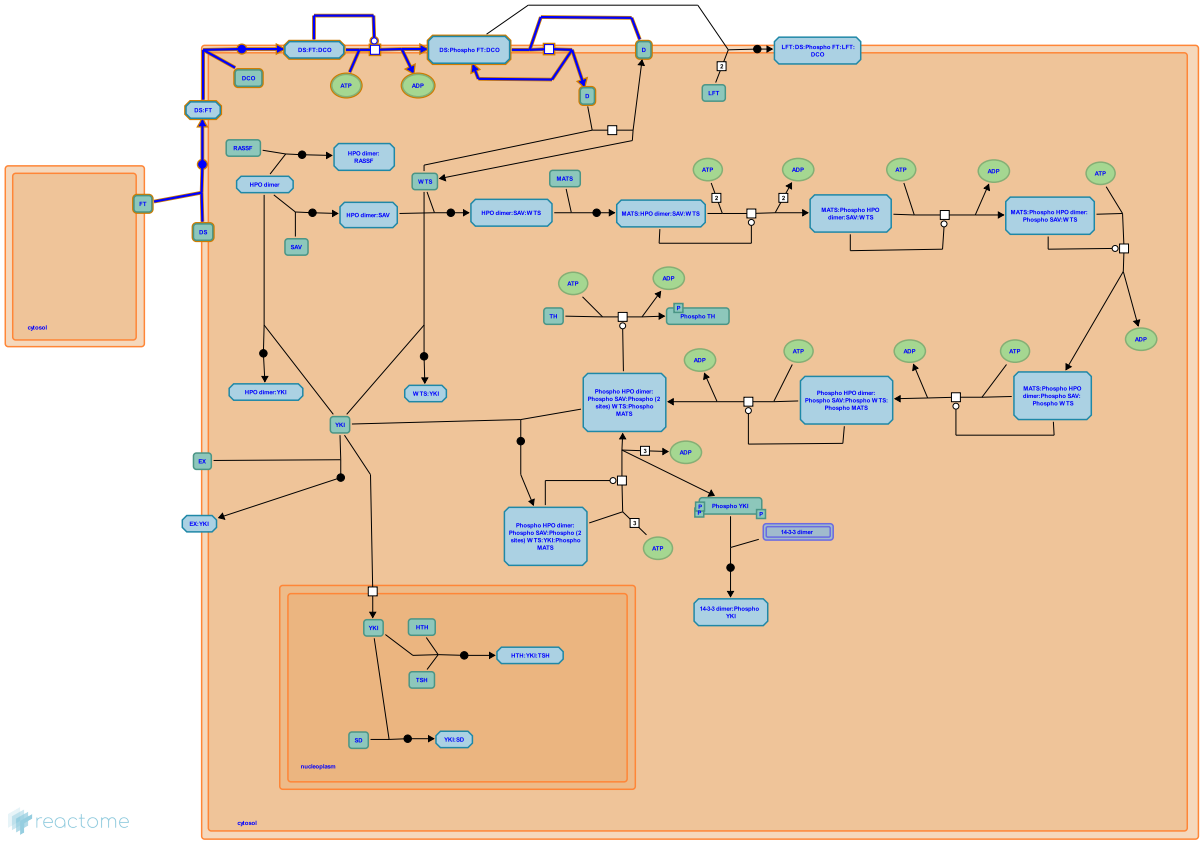
Subcellular localisation of D



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05/05/2024

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. ↗

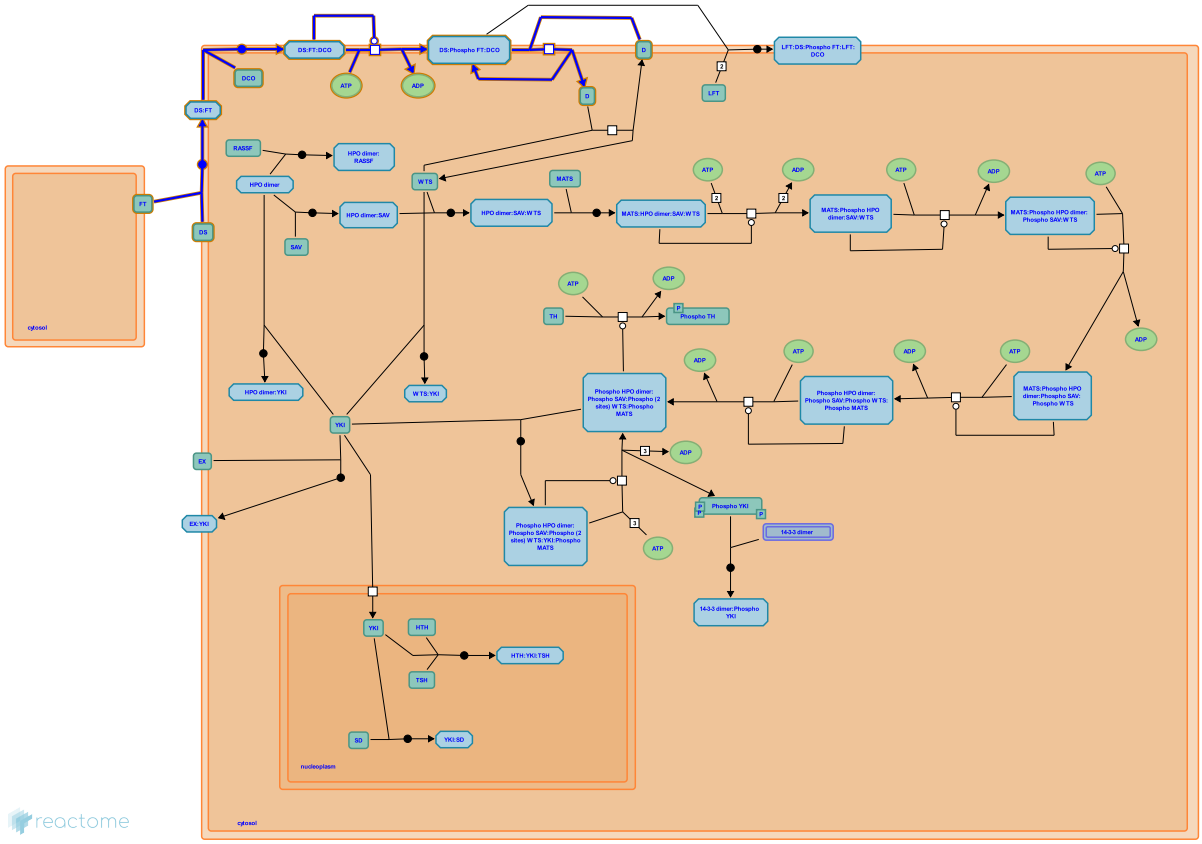
Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res, 46*, D649-D655. ↗

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. ↗

Subcellular localisation of D ↗

Stable identifier: R-DME-390023

Compartments: cytosol



Spatzle (SPZ) dimer binding leads to Toll (TL) receptor homodimerisation and activation.

Literature references

Tapon, N., Harvey, K. (2007). The Salvador-Warts-Hippo pathway - an emerging tumour-suppressor network. *Nat Rev Cancer, 7*, 182-91. ↗

Editions

2009-01-23	Authored, Edited	Williams, MG.
2009-11-25	Reviewed	Irvine, KD.

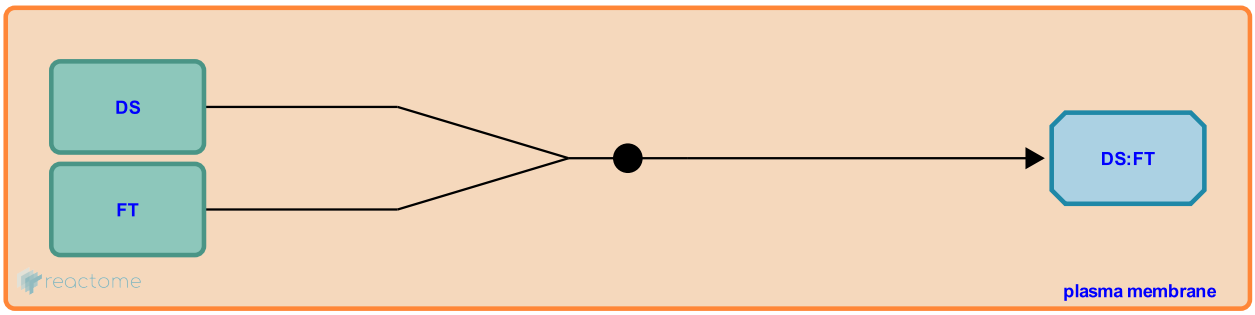
FT binds to DS in an adjacent cell ↗

Location: Subcellular localisation of D

Stable identifier: R-DME-350440

Type: binding

Compartments: plasma membrane



The transmembrane non-classical cadherin Fat (FT) binds extracellularly to the transmembrane non-classical cadherin Dachsous (DS) in adjacent cells.

Followed by: DCO binds to FT

Literature references

Blair, SS., Matakatsu, H. (2004). Interactions between Fat and Dachsous and the regulation of planar cell polarity in the Drosophila wing. *Development, 131*, 3785-94. ↗

Axelrod, JD., Simon, MA., Yang, CH., Ma, D., McNeill, H. (2003). Fidelity in planar cell polarity signalling. *Nature, 421*, 543-7. ↗

Simon, MA., Axelrod, JD., Yang, CH. (2002). Regulation of Frizzled by fat-like cadherins during planar polarity signaling in the Drosophila compound eye. *Cell, 108*, 675-88. ↗

Blair, SS., Matakatsu, H. (2006). Separating the adhesive and signaling functions of the Fat and Dachsous protocadherins. *Development, 133*, 2315-24. ↗

Editions

2008-05-19	Authored, Edited	Williams, MG.
2009-11-25	Reviewed	Irvine, KD.

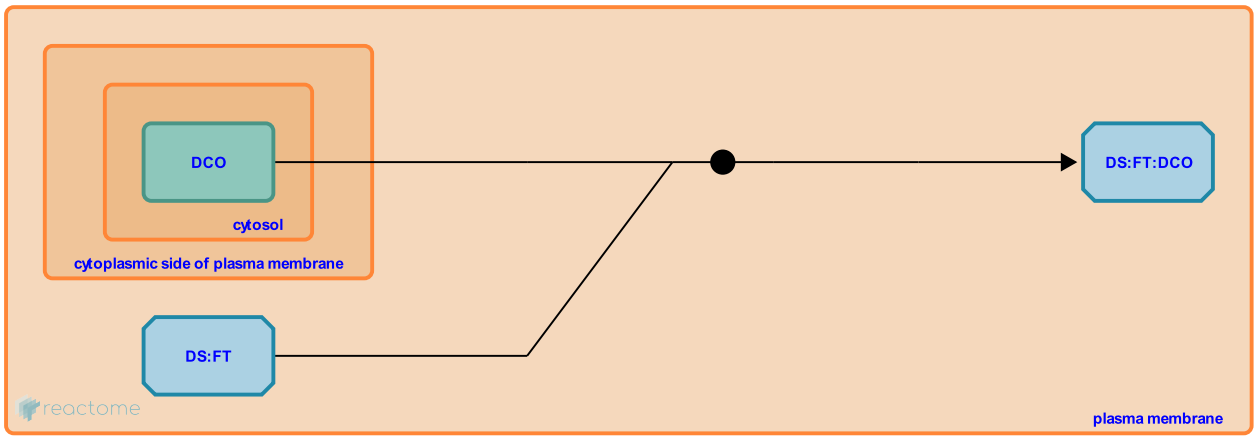
DCO binds to FT ↗

Location: Subcellular localisation of D

Stable identifier: R-DME-451839

Type: binding

Compartments: plasma membrane, cytosol



Fat (FT) is cleaved in its extracellular domain at an unknown site with the two fragments produced remaining stably associated after processing. The casein kinase 1 epsilon orthologue, Discs overgrown (DCO) binds to the cytoplasmic part of FT.

Preceded by: FT binds to DS in an adjacent cell

Followed by: FT is phosphorylated by DCO

Literature references

Feng, Y., Irvine, KD. (2009). Processing and phosphorylation of the Fat receptor. *Proc Natl Acad Sci U S A, 106*, 11989-94. ↗

Clayton, L., Arbouzova, NI., Saburi, S., Varelas, X., Silva, E., Wrana, J. et al. (2009). Phosphorylation of the tumor suppressor fat is regulated by its ligand Dachsous and the kinase discs overgrown. *Curr Biol, 19*, 1112-7. ↗

Editions

2009-11-25	Reviewed	Irvine, KD.
2010-01-14	Authored, Edited	Williams, MG.

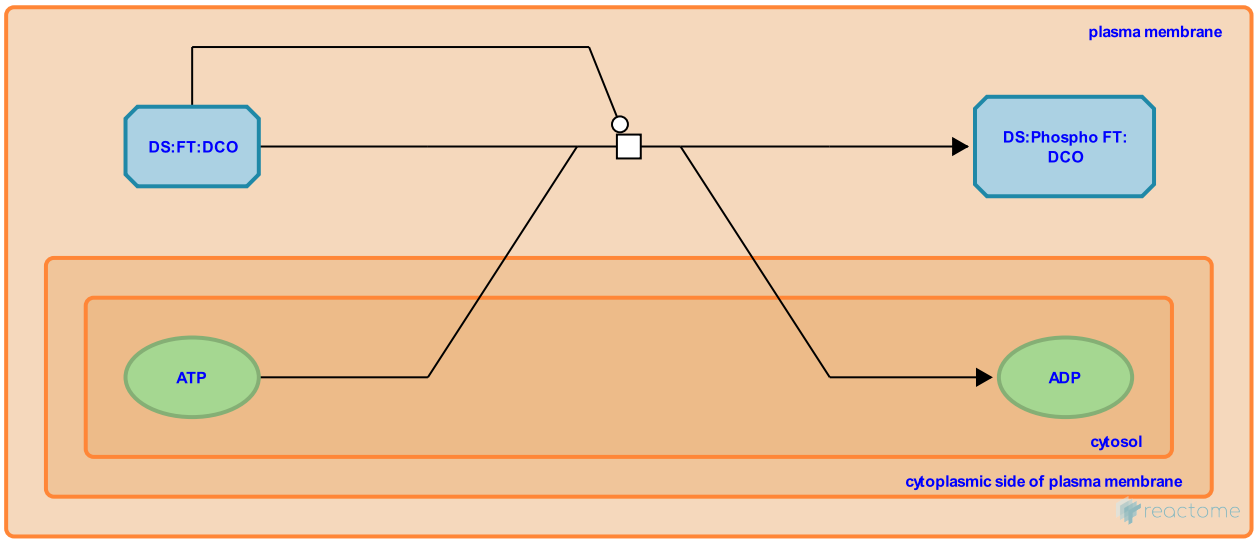
FT is phosphorylated by DCO ↗

Location: Subcellular localisation of D

Stable identifier: R-DME-451856

Type: transition

Compartments: plasma membrane, cytosol



The casein kinase 1 epsilon orthologue, Discs overgrown (DCO) phosphorylates the cytoplasmic part of FT at unknown residues.

Preceded by: DCO binds to FT

Followed by: Phospho FT reduces D accumulation at the plasma membrane

Literature references

Feng, Y., Irvine, KD. (2009). Processing and phosphorylation of the Fat receptor. *Proc Natl Acad Sci U S A, 106*, 11989-94. ↗

Clayton, L., Arbouzova, NI., Saburi, S., Varelas, X., Silva, E., Wrana, J. et al. (2009). Phosphorylation of the tumor suppressor fat is regulated by its ligand Dachsous and the kinase discs overgrown. *Curr Biol, 19*, 1112-7. ↗

Editions

2009-11-25	Reviewed	Irvine, KD.
2010-01-14	Authored, Edited	Williams, MG.

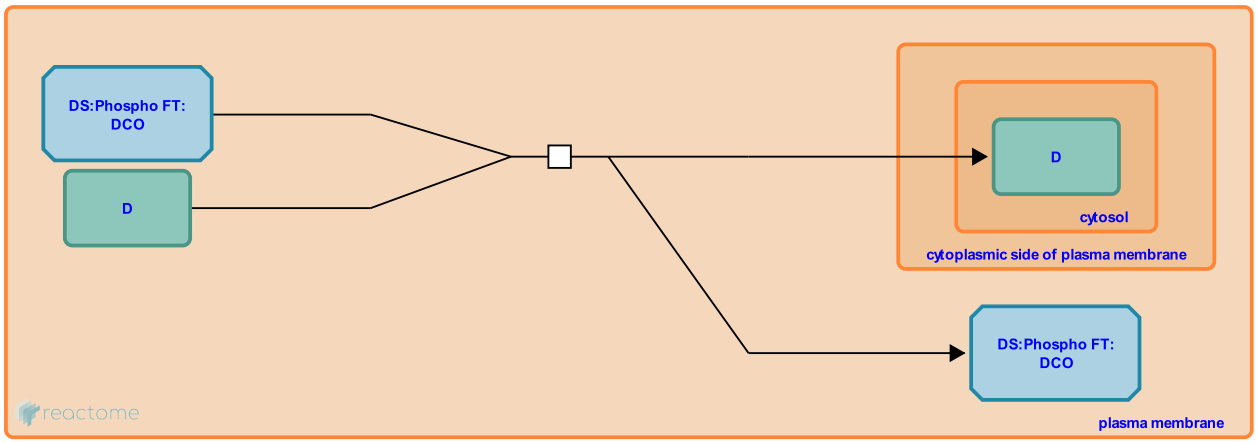
Phospho FT reduces D accumulation at the plasma membrane ↗

Location: Subcellular localisation of D

Stable identifier: R-DME-390116

Type: transition

Compartments: plasma membrane, cytosol



There are observations that Fat (FT), Dachsous (DS), and Four-jointed (FJ) modulate the subcellular localisation of Dachs (D). In the absence of FT, D accumulates at the plasma membrane. These suggest a simple model whereby signalling through FT regulates the stability of the serine/threonine kinase, Warts (WTS), by reducing protein levels of D at the plasma membrane so it fails to interact with WTS.

Preceded by: FT is phosphorylated by DCO

Literature references

Fehon, R., Irvine, KD., Maitra, S., Rauskolb, C., Feng, Y., Cho, E. (2006). Delineation of a Fat tumor suppressor pathway. *Nat Genet, 38*, 1142-50. ↗

Minihan, G., Irvine, KD., Hu, WL., Rauskolb, C., Mao, Y., Hayter, H. et al. (2006). Dachs: an unconventional myosin that functions downstream of Fat to regulate growth, affinity and gene expression in Drosophila. *Development, 133*, 2539-51. ↗

Editions

2009-01-23	Authored, Edited	Williams, MG.
2009-11-25	Reviewed	Irvine, KD.

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