DENND3 exchanges GTP for GDP on RAB12

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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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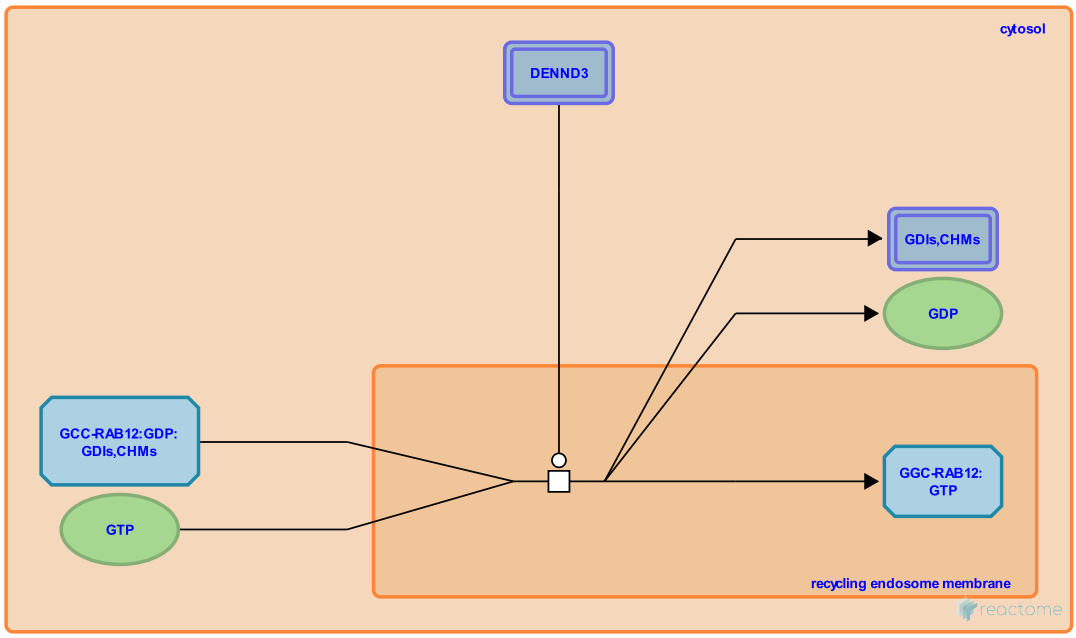
Stable identifier: R-HSA-8876454

Type: transition

Compartments: recycling endosome membrane, cytosol



DENND3 is a RAB12-specific GEF with roles in macroautophagy and the trafficking of proteins from the recycling endosome to the lysosome (Yoshimura et al, 2010; Matsui et al, 2014; Xu et al, 2015; reviewed in Xu and McPherson, 2015). DENND3 activity promotes the formation of active RAB12:GTP, required for the constitutive degradation of plasma membrane proteins such as the transferrin receptor and the amino acid transporter SLC36A4, also known as PAT4 (Matsui et al, 2011; Matsui and Fukuda, 2013; Matsui et al, 2014; Sirohi et al, 2013). Under starvation conditions, DENND3 is phosphorylated by the macroautophagy-promoting kinase ULK1. DENND3- and RAB12-dependent degradation of SLC36A4 contributes to the activation of the macroautophagy pathway by decreasing intracellular amino-acid levels and inhibiting mTORC1 (Matsui and Fukuda, 2013; Matsui et al, 2014; Xu et al, 2015; Fan et al, 2016; reviewed in Xu and McPherson, 2015).

Literature references

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Editions

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