

RHEB in mTORC1:RHEB:GTP hydrolyses

GTP

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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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Reactome database release: 88

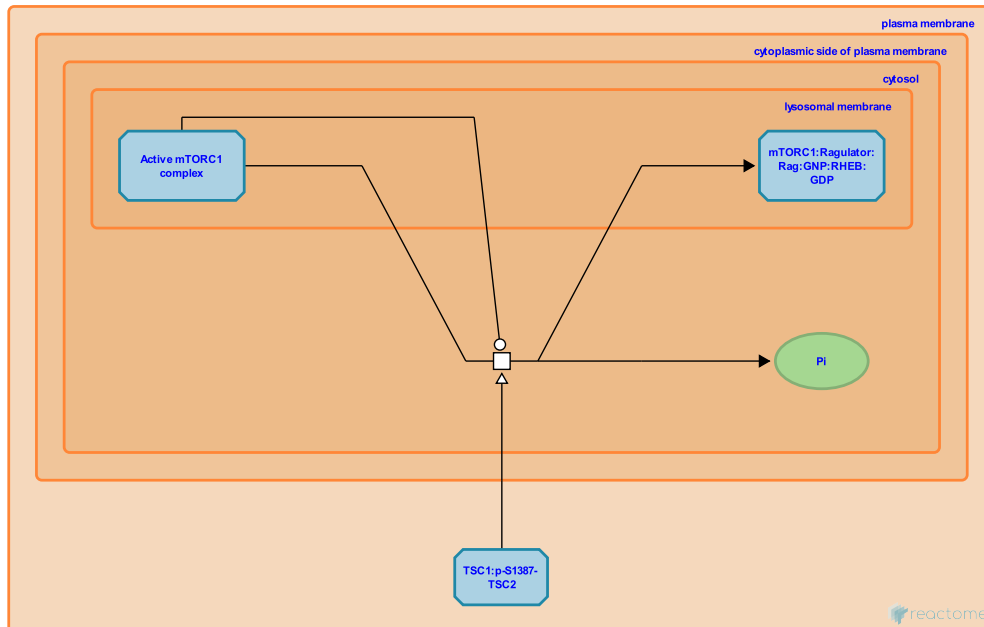
This document contains 1 reaction ([see Table of Contents](#))

RHEB in mTORC1:RHEB:GTP hydrolyses GTP [↗](#)

Stable identifier: R-HSA-380979

Type: transition

Compartments: cytosol, lysosomal membrane



TSC2 (in the TSC complex) functions as a GTPase-activating protein and stimulates the intrinsic GTPase activity of the small G-protein Rheb. This results in the conversion of Rheb:GTP to Rheb:GDP. GDP-bound Rheb is unable to activate mTOR (Inoki et al. 2003, Tee et al. 2003). It is not demonstrated that RHEB hydrolyzes GTP when present in the mTORC1 complex; given the low affinity of RHEB for mTOR, it may dissociate from the mTORC1 complex before TSC2 stimulates hydrolysis of GTP; TSC2 may not have access to critical residues of RHEB when present inside mTORC1.

Literature references

Tee, AR., Manning, BD., Cantley, LC., Blenis, J., Roux, PP. (2003). Tuberous sclerosis complex gene products, Tuberin and Hamartin, control mTOR signaling by acting as a GTPase-activating protein complex toward Rheb. *Curr Biol*, 13, 1259-68. [↗](#)

Inoki, K., Guan, KL., Li, Y., Xu, T. (2003). Rheb GTPase is a direct target of TSC2 GAP activity and regulates mTOR signaling. *Genes Dev*, 17, 1829-34. [↗](#)

Editions

2008-11-19	Edited	Jassal, B.
2008-11-19	Authored	Wu, J., Katajisto, P., Makela, T.
2015-04-08	Revised	Jupe, S.
2015-05-14	Reviewed	Zwartkruis, FJ.
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