

# RAB8 GEFs exchange GTP for GDP on RAB8

Marat, AL., Rothfels, K.

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](https://creativecommons.org/licenses/by/4.0/). For more information see our [license](https://reactome.org/licenses/).

07/05/2024

## 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. [↗](#)

Reactome database release: 88

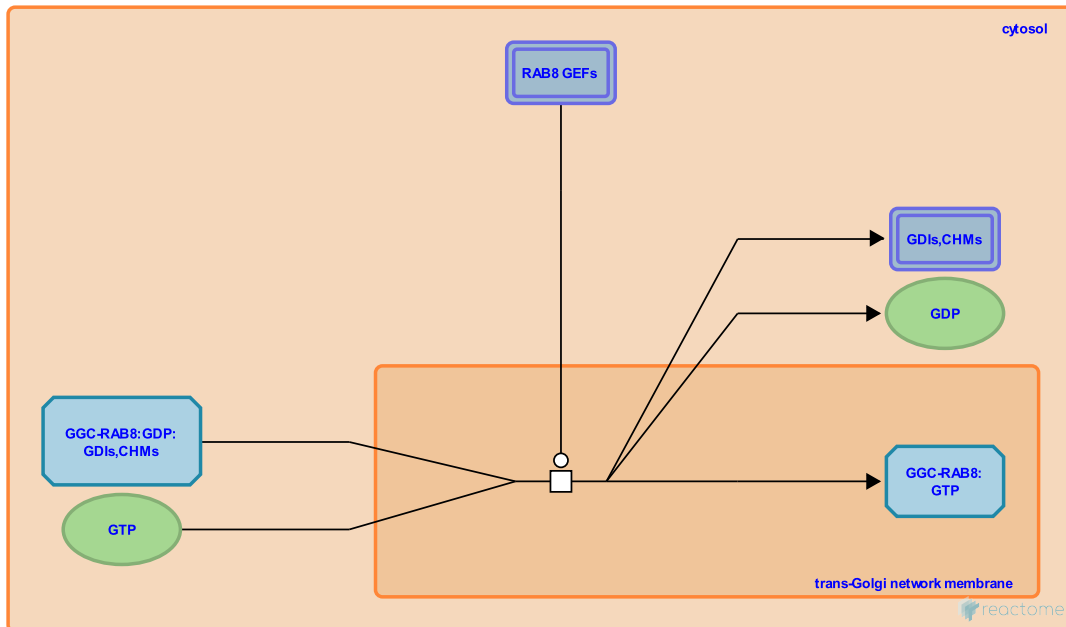
This document contains 1 reaction ([see Table of Contents](#))

## RAB8 GEFs exchange GTP for GDP on RAB8 [↗](#)

**Stable identifier:** R-HSA-8876190

**Type:** transition

**Compartments:** trans-Golgi network membrane, cytosol



RAB8 is involved in trafficking from the trans-Golgi network (TGN) to the plasma membrane, contributes, with RAB10, 13 and 14 to GLUT4 transport, and plays a role in the formation of the primary cilium (Huber et al, 1993; Ishikura et al, 2008; Sun et al, 2010; Nachury et al, 2007; Yoshimura et al, 2007; reviewed in Hoffman and Elmendorf, 2011; Reiter et al, 2012). RAB8 also plays a role in regulating G2/M transition in complex with Optineurin (OPTN) (Kachaner et al, 2012).

RAB3IP is the best characterized GEF for RAB8A, with established roles in ciliogenesis (Hatulla et al, 2002; Knodler et al, 2010; Westlake et al, 2012; Wang et al, 2012; Feng et al, 2012; reviewed in Sung and Leroux, 2013). Other potential RAB8 GEFs include RAB3IPL and DENND1C (Yoshimura et al, 2010; reviewed in Ishida et al, 2016). Interaction of RAB8 with its GEFs displaces the GDI or CHM protein that keeps the inactive RAB:GDP soluble in the cytosol and promotes membrane association of RAB8 (reviewed in Wandinger-Ness and Zerial, 2014; Ishida et al, 2016)

### Literature references

- Klip, A., Ishikura, S. (2008). Muscle cells engage Rab8A and myosin Vb in insulin-dependent GLUT4 translocation. *Am J Physiol Cell Physiol*, 295, C1016-25. [↗](#)
- Leroux, MR., Blacque, OE., Reiter, JF. (2012). The base of the cilium: roles for transition fibres and the transition zone in ciliary formation, maintenance and compartmentalization. *EMBO Rep.*, 13, 608-18. [↗](#)
- Linford, A., Rigden, DJ., Barr, FA., Gerondopoulos, A., Yoshimura, S. (2010). Family-wide characterization of the DENN domain Rab GDP-GTP exchange factors. *J. Cell Biol.*, 191, 367-81. [↗](#)
- Liu, Z., Klip, A., Sun, Y., Bilan, PJ. (2010). Rab8A and Rab13 are activated by insulin and regulate GLUT4 translocation in muscle cells. *Proc Natl Acad Sci U S A*, 107, 19909-14. [↗](#)
- Das, A., Zhang, J., Zhang, X., Guo, W., Knödler, A., Feng, S. et al. (2010). Coordination of Rab8 and Rab11 in primary ciliogenesis. *Proc. Natl. Acad. Sci. U.S.A.*, 107, 6346-51. [↗](#)

### Editions

2016-06-29	Authored, Edited	Rothfels, K.
2016-08-03	Reviewed	Marat, AL.