

# ADORA2B (in Ade-Rib:ADORA2B:Hetero-trimeric G-protein Gs) exchanges GDP for GTP on Gs

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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

- 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

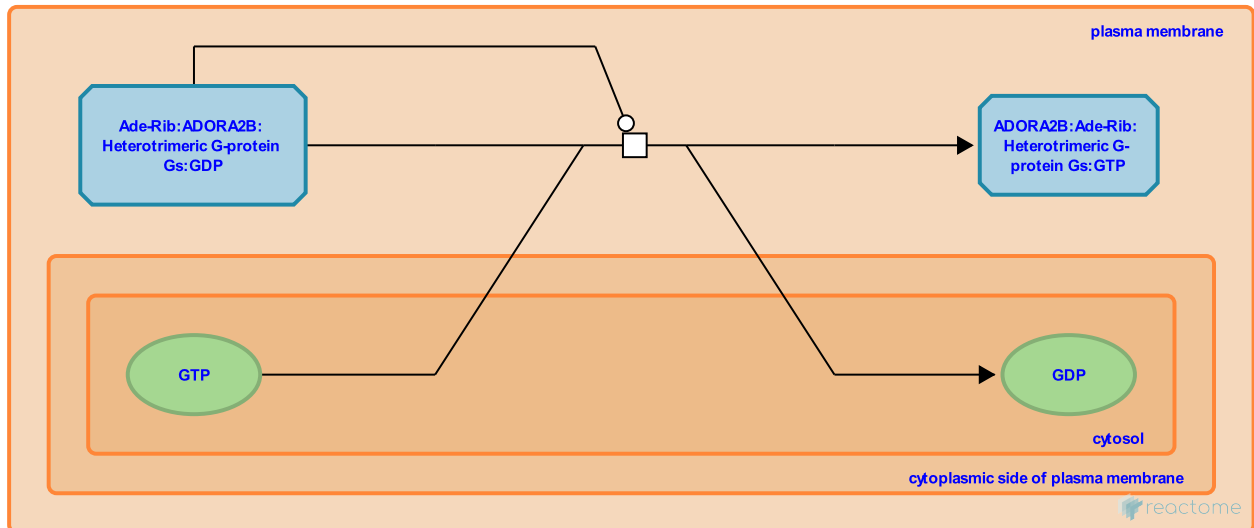
This document contains 1 reaction ([see Table of Contents](#))

## ADORA2B (in Ade-Rib:ADORA2B:Heterotrimeric G-protein Gs) exchanges GDP for GTP on Gs [↗](#)

**Stable identifier:** R-HSA-9660824

**Type:** transition

**Compartments:** cytosol, plasma membrane



The liganded receptor undergoes a conformational change, generating a signal that is propagated in a manner that is not completely understood to the G-protein. This stimulates the exchange of GDP for GTP in the G-protein alpha subunit, activating the G-protein. This event is negatively regulated by some Activators of G protein signaling (AGS) proteins, a class of proteins identified in yeast functional screens for proteins able to activate G protein signaling in the absence of a G protein-coupled receptor (GPCR) (Cismowski et al. 1999, Takesono et al. 1999). AGS proteins contain G protein regulatory (GPR) motifs (also referred to as the GoLoco motif) that bind and stabilize the Galpha subunit in its GDP-bound conformation (Mochizuki et al. 1996, Peterson et al. 2000, Cao et al. 2004, Blumer & Lanier 2014). Some RGS proteins similarly bind to Galpha preventing the exchange of GDP for GTP (Soundararajan et al. 2008).

### Literature references

- Baker, LP., Metcalf, MA., Obrietan, K., Storm, DR., Impey, S., Chan, G. et al. (1998). Stimulation of type 1 and type 8 Ca<sup>2+</sup>/calmodulin-sensitive adenylyl cyclases by the Gs-coupled 5-hydroxytryptamine subtype 5-HT<sub>7A</sub> receptor. *J Biol Chem*, 273, 17469-76. [↗](#)
- Liu, HY., Seifert, R., Wenzel-Seifert, K. (2002). Similarities and differences in the coupling of human beta1- and beta2-adrenoceptors to Gs(alpha) splice variants. *Biochem Pharmacol*, 64, 9-20. [↗](#)
- Itoh, H., Tsukamoto, T., Kozasa, T., Kaziro, Y. (1988). Isolation and characterization of the human Gs alpha gene. *Proc Natl Acad Sci U S A*, 85, 2081-5. [↗](#)
- Dunlop, J., Schechter, L., Smith, D., Zhang, JY., Spangler, T., Kowal, D. et al. (2003). Characterization of the 5-HT<sub>6</sub> receptor coupled to Ca<sup>2+</sup> signaling using an enabling chimeric G-protein. *Eur J Pharmacol*, 472, 33-8. [↗](#)
- Mitsubishi, M., Mitsubishi, T., Payan, DG. (1989). Multiple signaling pathways of histamine H<sub>2</sub> receptors. Identification of an H<sub>2</sub> receptor-dependent Ca<sup>2+</sup> mobilization pathway in human HL-60 promyelocytic leukemia cells. *J Biol Chem*, 264, 18356-62. [↗](#)

### Editions

2020-01-07	Authored, Edited	Jassal, B.
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