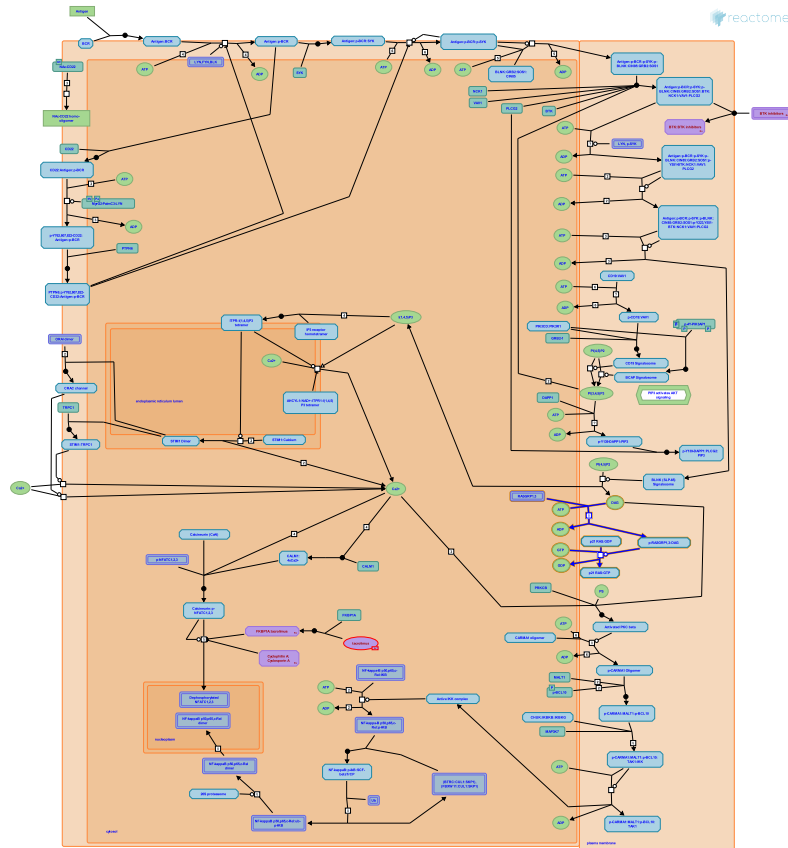


Activation of RAS in B cells



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This is just an excerpt of a full-length report for this pathway. To access the complete report, please download it at the [Reactome Textbook](https://reactome.org/textbook/).

04/05/2024

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.

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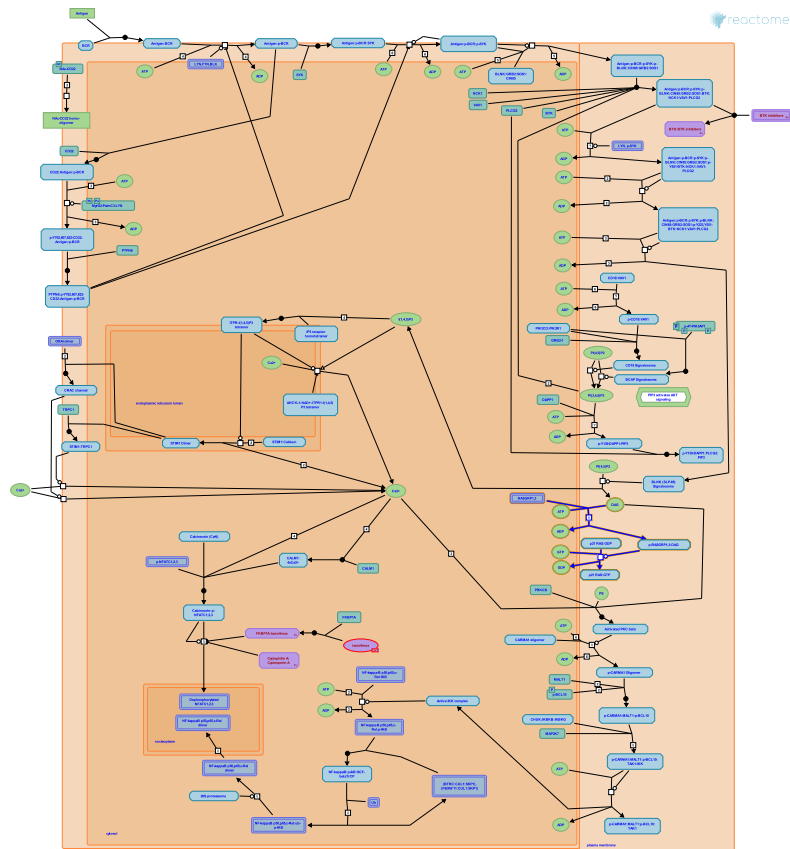
Reactome database release: 88

This document contains 1 pathway and 2 reactions ([see Table of Contents](#))

Activation of RAS in B cells ↗

Stable identifier: R-HSA-1169092

Compartments: cytosol, plasma membrane



RasGRP1 and RasGRP3 bind diacylglycerol at the plasma membrane (Lorenzo et al. 2001) and are phosphorylated by protein kinase C (Teixeira et al. 2003, Zheng et al. 2005). Phosphorylated RasGRP1 (Roose et al. 2007) and RasGRP3 (Ohba et al. 2000, Yamashita et al. 2000, Rebhun et al. 2000, Lorenzo et al. 2001) then catalyze the exchange of GDP for GTP bound by RAS, thereby activating RAS.

Literature references

- Ho, M., Roose, JP., Weiss, A., Kurosaki, T., Mollenauer, M. (2007). Unusual interplay of two types of Ras activators, RasGRP and SOS, establishes sensitive and robust Ras activation in lymphocytes. *Mol Cell Biol*, 27, 2732-45. ↗
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Editions

2011-01-04	Authored, Edited	May, B.
2012-02-12	Reviewed	Wienands, J.

RasGRP1 and RasGRP3 binds diacylglycerol and is phosphorylated ↗

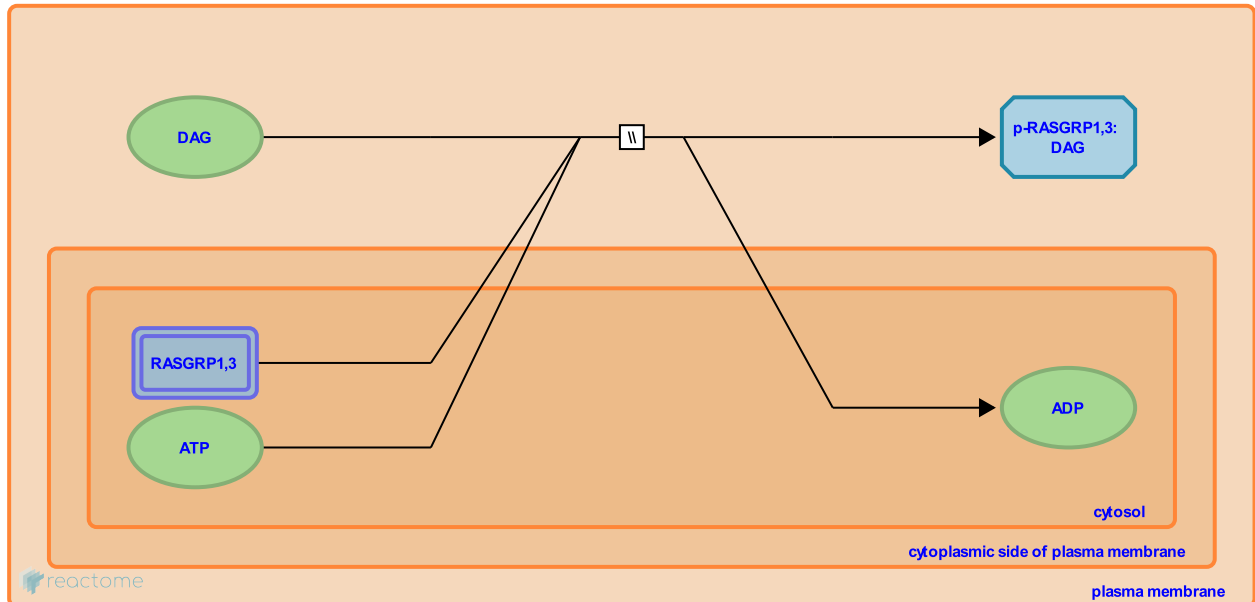
Location: [Activation of RAS in B cells](#)

Stable identifier: R-HSA-1168374

Type: omitted

Compartments: plasma membrane, cytosol

Inferred from: [Rasgrp1 and Rasgrp3 are recruited to the membrane and phosphorylated \(Mus musculus\)](#)



RasGRP1 and RasGRP3 translocate to the plasma membrane where they bind diacylglycerol (Lorenzo et al. 2001) and are phosphorylated (Teixeira et al. 2003, Zheng et al. 2005). Though RasGRP3 is phosphorylated in vitro and in some cell lines (e.g. Ramos cells) by protein kinase C theta (PKC-theta, Zheng et al. 2005), normal B cells do not contain PKC-theta (Meller et al. 1999). Both Rasgrp1 and Rasgrp3 participate in activating Ras in response to BCR signaling in mouse B cells (Coughlin et al. 2005).

Followed by: [p-RasGRP1,3:DAG cause RAS to exchange GDP for GTP](#)

Literature references

- Stone, JC., Stang, SL., Coughlin, JJ., Dower, NA. (2005). RasGRP1 and RasGRP3 regulate B cell proliferation by facilitating B cell receptor-Ras signaling. *J Immunol*, 175, 7179-84. ↗
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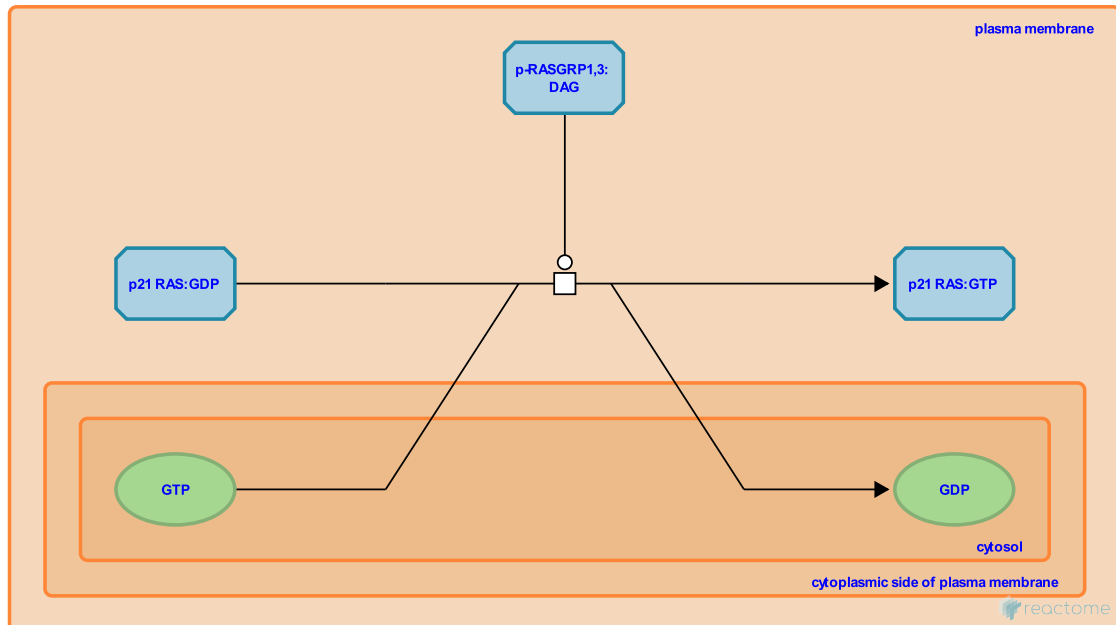
p-RasGRP1,3:DAG cause RAS to exchange GDP for GTP ↗

Location: [Activation of RAS in B cells](#)

Stable identifier: R-HSA-1168636

Type: transition

Compartments: plasma membrane



RasGRP1 (Roose et al. 2007) and RasGRP3 (Ohba et al. 2000, Yamashita et al. 2000, Rebhun et al. 2000, Lorenzo et al. 2001) catalyze the exchange of GDP for GTP bound by RAS.

Preceded by: [RasGRP1 and RasGRP3 binds diacylglycerol and is phosphorylated](#)

Literature references

- Ho, M., Roose, JP., Weiss, A., Kurosaki, T., Mollenauer, M. (2007). Unusual interplay of two types of Ras activators, RasGRP and SOS, establishes sensitive and robust Ras activation in lymphocytes. *Mol Cell Biol*, 27, 2732-45. ↗
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