

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: 83

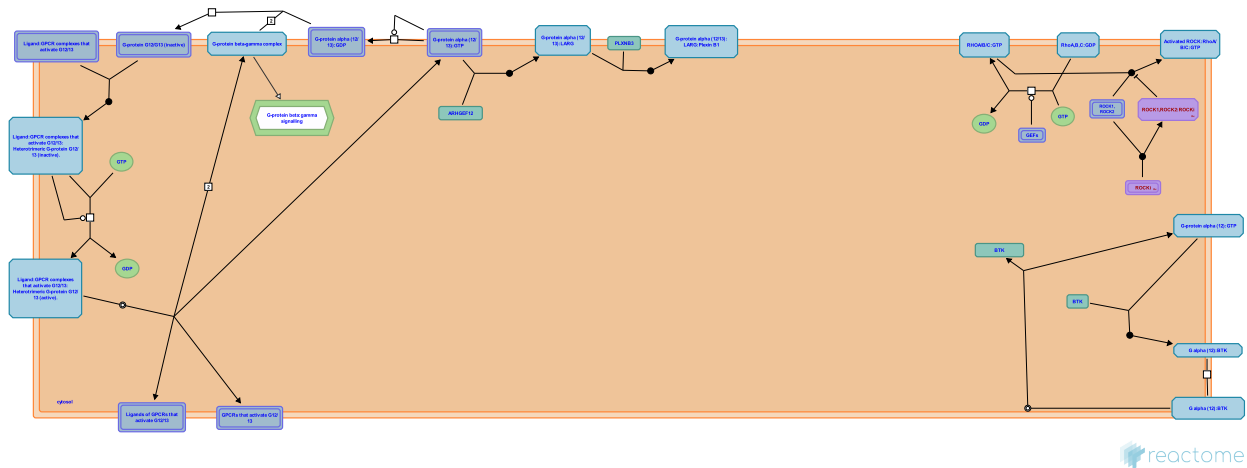
This document contains 1 pathway and 13 reactions ([see Table of Contents](#))

G alpha (12/13) signalling events ↗

Stable identifier: R-GGA-416482

Compartments: cytoplasmic side of plasma membrane

Inferred from: G alpha (12/13) signalling events (Homo sapiens)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

Liganded G12/13-activating GPCRs bind inactive heterotrimeric G-protein G12/13 ↗

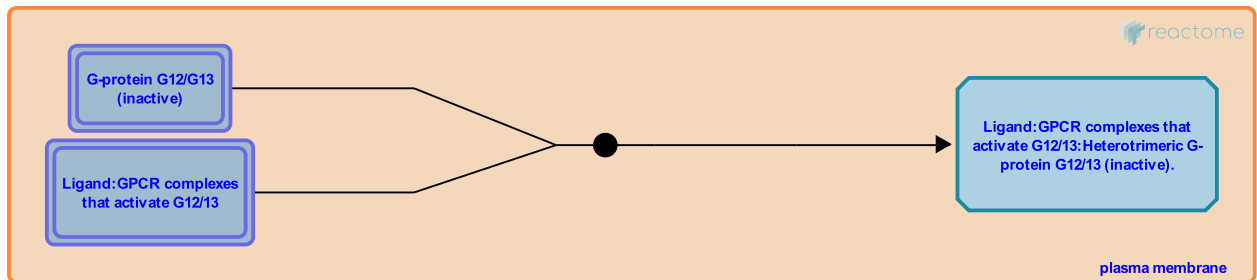
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-751027

Type: binding

Compartments: plasma membrane

Inferred from: [Liganded G12/13-activating GPCRs bind inactive heterotrimeric G-protein G12/13 \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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Followed by: [Liganded G12/13-activating GPCR acts as a GEF for G12/13](#)

Liganded G12/13-activating GPCR acts as a GEF for G12/13 ↗

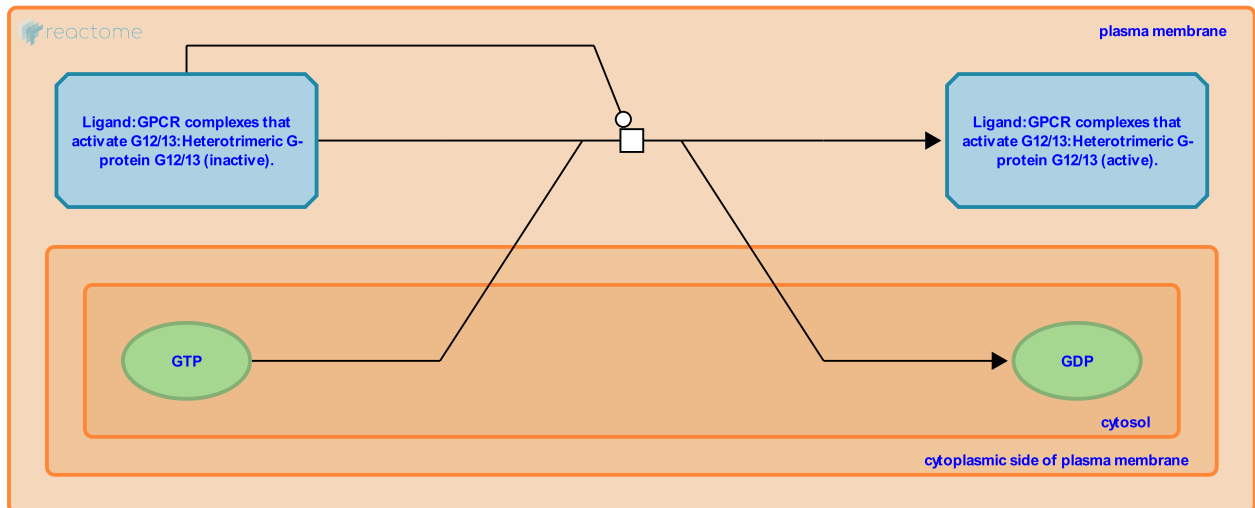
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-751029

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [Liganded G12/13-activating GPCR acts as a GEF for G12/13 \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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Preceded by: [Liganded G12/13-activating GPCRs bind inactive heterotrimeric G-protein G12/13](#)

Followed by: [The Ligand:GPCR:G12/13 complex dissociates](#)

The Ligand:GPCR:G12/13 complex dissociates ↗

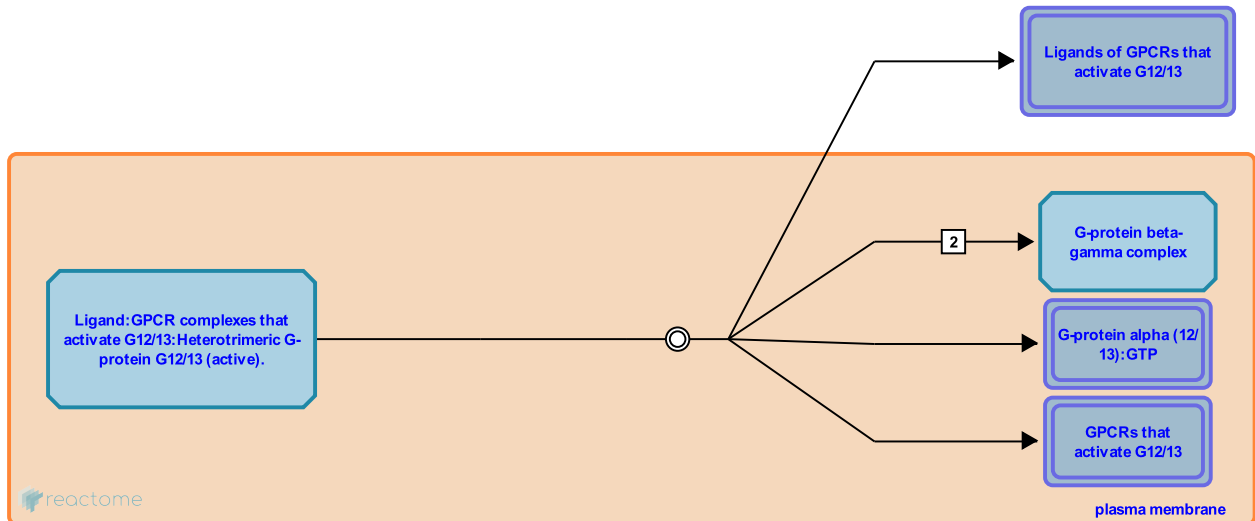
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-751019

Type: dissociation

Compartments: plasma membrane, extracellular region

Inferred from: [The Ligand:GPCR:G12/13 complex dissociates \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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Preceded by: [Liganded G12/13-activating GPCR acts as a GEF for G12/13](#)

Followed by: [G alpha \(12/13\) auto-inactivates by hydrolysing GTP to GDP](#), [G alpha \(12\) binds BTK](#), [LARG activation by G alpha 12/13](#)

GEFs activate RhoA,B,C ↗

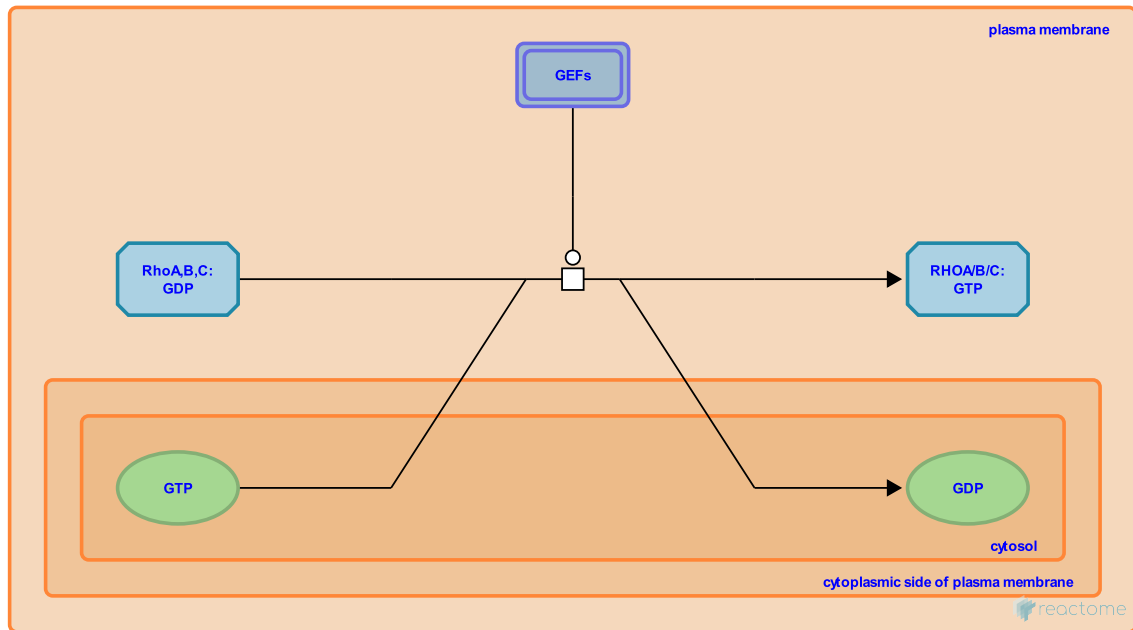
Location: G alpha (12/13) signalling events

Stable identifier: R-GGA-419166

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: GEFs activate RhoA,B,C (Homo sapiens)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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Preceded by: [LARG activation by G alpha 12/13](#)

Followed by: [ROCK activation by RHO](#)

ROCK activation by RHO ↗

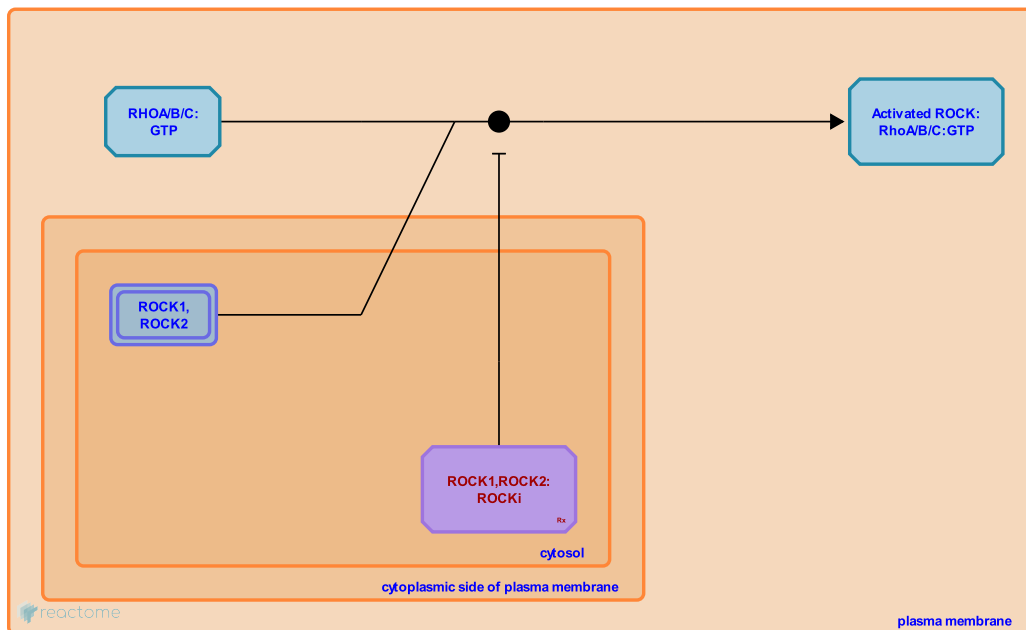
Location: G alpha (12/13) signalling events

Stable identifier: R-GGA-419049

Type: binding

Compartments: plasma membrane, cytosol

Inferred from: [ROCK activation by RHO \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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Preceded by: [GEFs activate RhoA,B,C](#)

ROCK1,2 bind ROCKi ↗

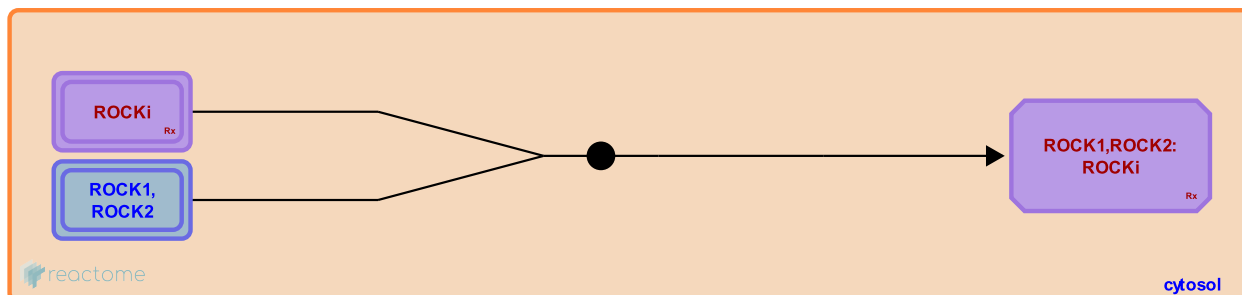
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-9680443

Type: binding

Compartments: cytosol

Inferred from: [ROCK1,2 bind ROCKi \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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LARG activation by G alpha 12/13 ↗

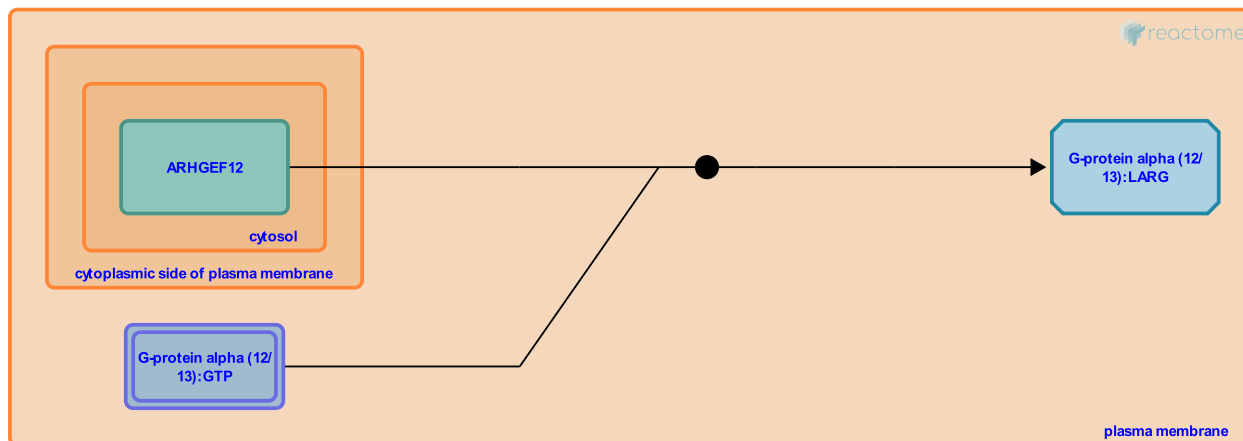
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-398184

Type: binding

Compartments: plasma membrane, cytosol

Inferred from: [LARG activation by G alpha 12/13 \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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Preceded by: [The Ligand:GPCR:G12/13 complex dissociates](#)

Followed by: [LARG binds plexin B1](#), [GEFs activate RhoA,B,C](#)

LARG binds plexin B1 ↗

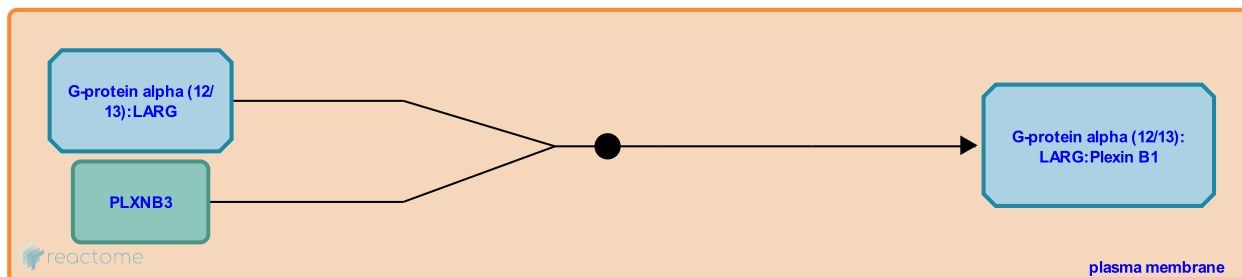
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-398185

Type: binding

Compartments: plasma membrane, cytosol

Inferred from: [LARG binds plexin B1 \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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Preceded by: [LARG activation by G alpha 12/13](#)

G alpha (12/13) auto-inactivates by hydrolysing GTP to GDP ↗

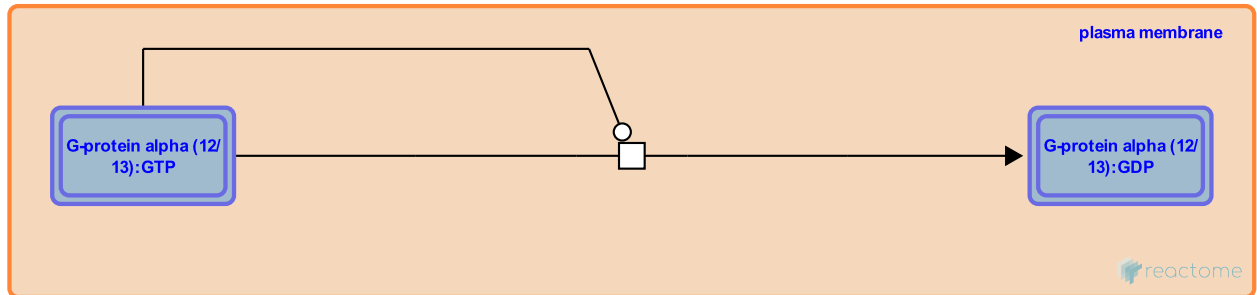
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-418574

Type: transition

Compartments: plasma membrane, cytosol

Inferred from: [G alpha \(12/13\) auto-inactivates by hydrolysing GTP to GDP \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

Preceded by: [The Ligand:GPCR:G12/13 complex dissociates](#)

Followed by: [Inactive G alpha \(12/13\) reassociates with G beta:gamma](#)

Inactive G alpha (12/13) reassociates with G beta:gamma ↗

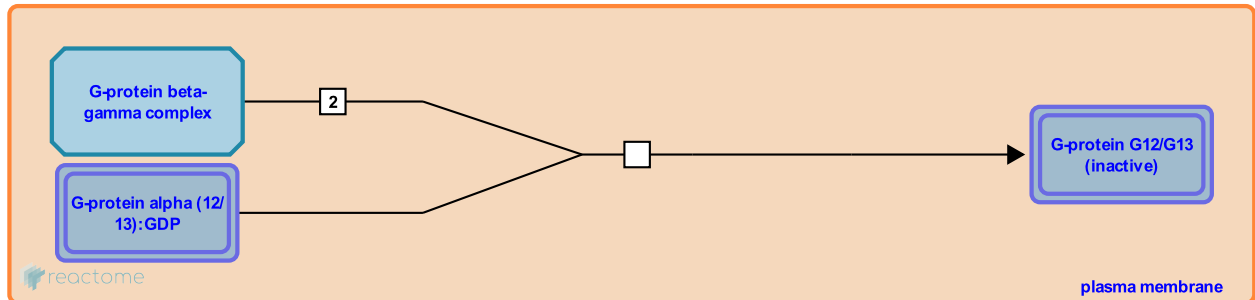
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-751039

Type: transition

Compartments: plasma membrane

Inferred from: [Inactive G alpha \(12/13\) reassociates with G beta:gamma \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

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Preceded by: [G alpha \(12/13\) auto-inactivates by hydrolysing GTP to GDP](#)

G alpha (12) binds BTK ↗

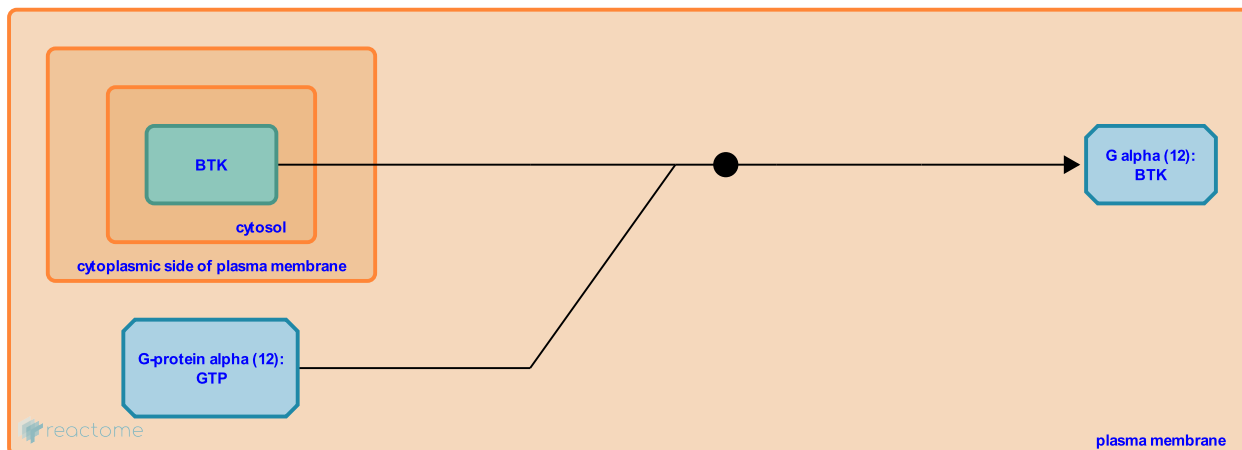
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-8964274

Type: binding

Compartments: plasma membrane, cytosol

Inferred from: [G alpha \(12\) binds BTK \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

Preceded by: [The Ligand:GPCR:G12/13 complex dissociates](#)

Followed by: [BTK in G alpha \(12\)-BTK complex is activated](#)

BTK in G alpha (12)-BTK complex is activated ↗

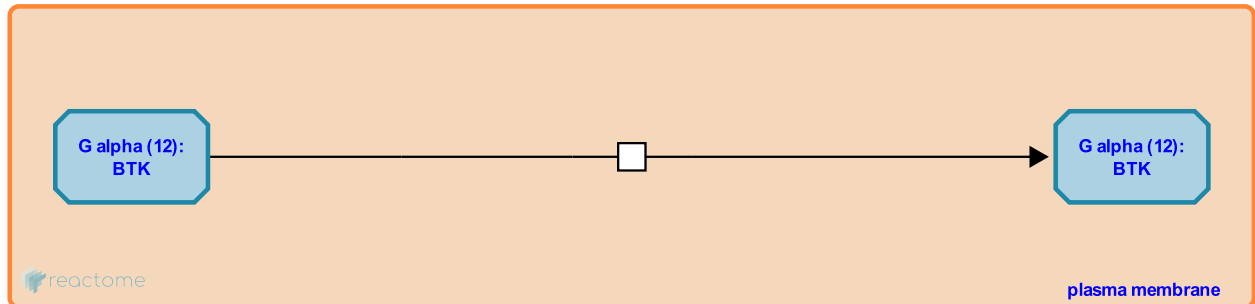
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-8964246

Type: transition

Compartments: plasma membrane

Inferred from: [BTK in G alpha \(12\)-BTK complex is activated \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

Preceded by: [G alpha \(12\) binds BTK](#)

Followed by: [G alpha \(12\)-BTK complex dissociates to Active BTK and G alpha \(12\)](#)

G alpha (12)-BTK complex dissociates to Active BTK and G alpha (12) ↗

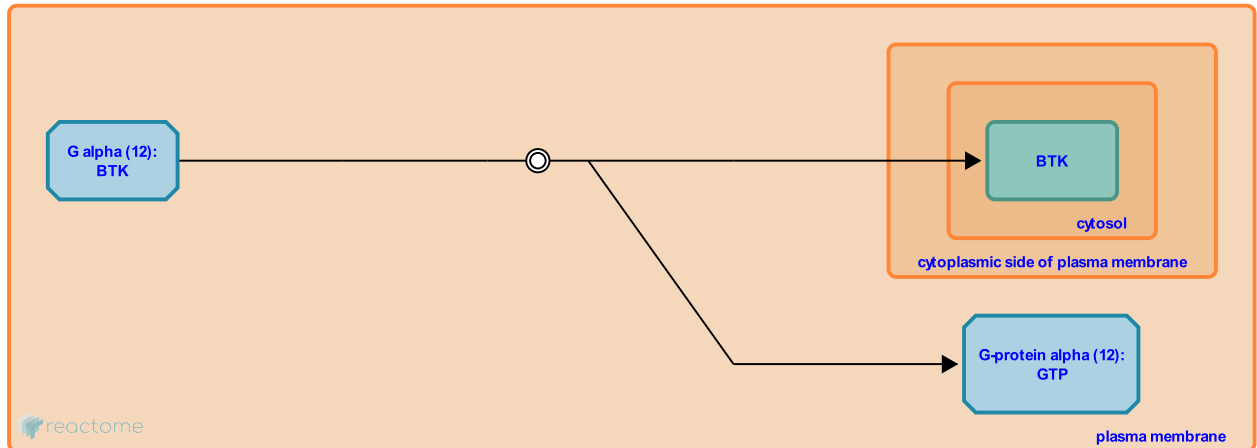
Location: [G alpha \(12/13\) signalling events](#)

Stable identifier: R-GGA-8964333

Type: dissociation

Compartments: plasma membrane, cytosol

Inferred from: [G alpha \(12\)-BTK complex dissociates to Active BTK and G alpha \(12\) \(Homo sapiens\)](#)



This event has been computationally inferred from an event that has been demonstrated in another species.

The inference is based on the homology mapping from PANTHER. Briefly, reactions for which all involved PhysicalEntities (in input, output and catalyst) have a mapped orthologue/paralogue (for complexes at least 75% of components must have a mapping) are inferred to the other species. High level events are also inferred for these events to allow for easier navigation.

[More details and caveats of the event inference in Reactome.](/electronic_inference_compara.html) For details on PANTHER see also: <http://www.pantherdb.org/about.jsp>

Preceded by: [BTK in G alpha \(12\)-BTK complex is activated](#)

Table of Contents

Introduction	1
☰ G alpha (12/13) signalling events	2
↳ Liganded G12/13-activating GPCRs bind inactive heterotrimeric G-protein G12/13	3
↳ Liganded G12/13-activating GPCR acts as a GEF for G12/13	4
↳ The Ligand:GPCR:G12/13 complex dissociates	5
↳ GEFs activate RhoA,B,C	6
↳ ROCK activation by RHO	7
↳ ROCK1,2 bind ROCKi	8
↳ LARG activation by G alpha 12/13	9
↳ LARG binds plexin B1	10
↳ G alpha (12/13) auto-inactivates by hydrolysing GTP to GDP	11
↳ Inactive G alpha (12/13) reassociates with G beta:gamma	12
↳ G alpha (12) binds BTK	13
↳ BTK in G alpha (12)-BTK complex is activated	14
↳ G alpha (12)-BTK complex dissociates to Active BTK and G alpha (12)	15
Table of Contents	16