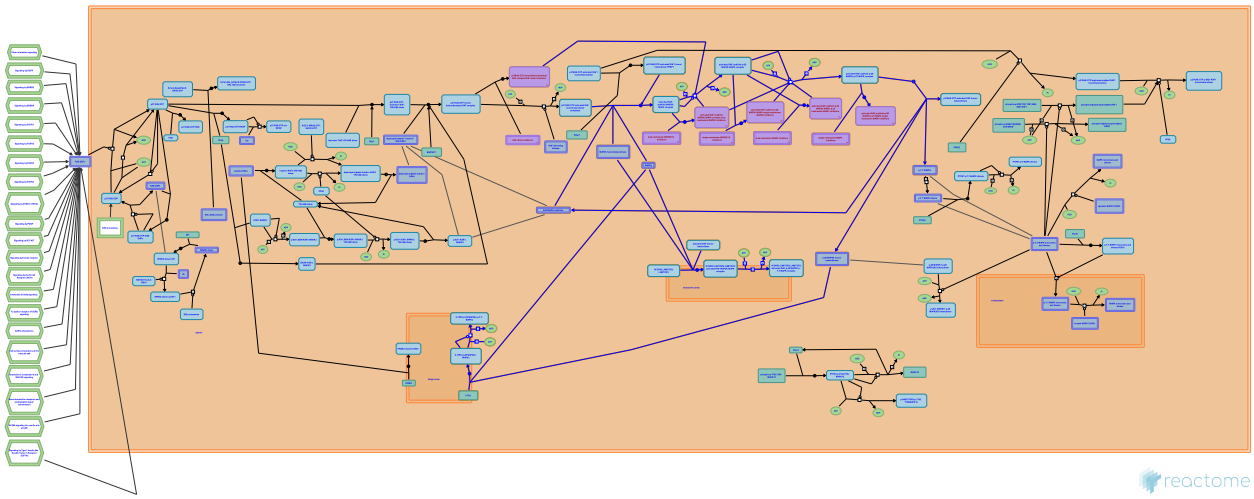
MAP2K and MAPK activation



European Bioinformatics Institute, New York University Langone Medical Center, Ontario Institute for Cancer Research, Oregon Health and Science University.

20/05/2024

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. ↗

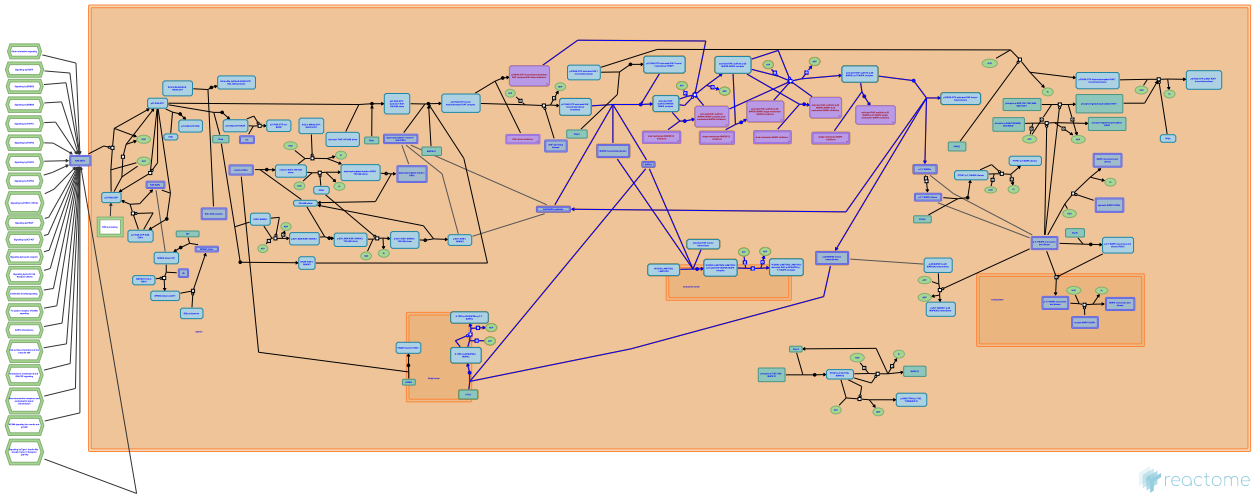
Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res, 46*, D649-D655. ↗

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. ↗

MAP2K and MAPK activation ↗

Stable identifier: R-RNO-5674135

Inferred from: MAP2K and MAPK activation (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. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

MAP2Ks and MAPKs bind to the activated RAF complex ↗

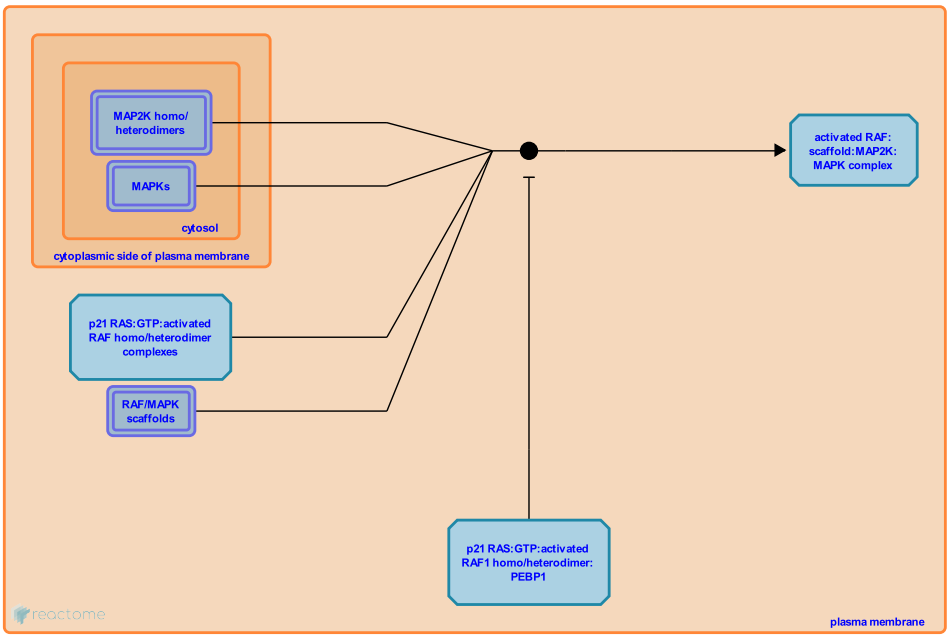
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-5672972

Type: binding

Compartments: plasma membrane

Inferred from: MAP2Ks and MAPKs bind to the activated RAF complex (Homo sapiens)



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Followed by: Dual mechanism MAP2K inhibitors bind MAP2Ks, RAF phosphorylates MAP2K dimer

Dual mechanism MAP2K inhibitors bind MAP2Ks ↗

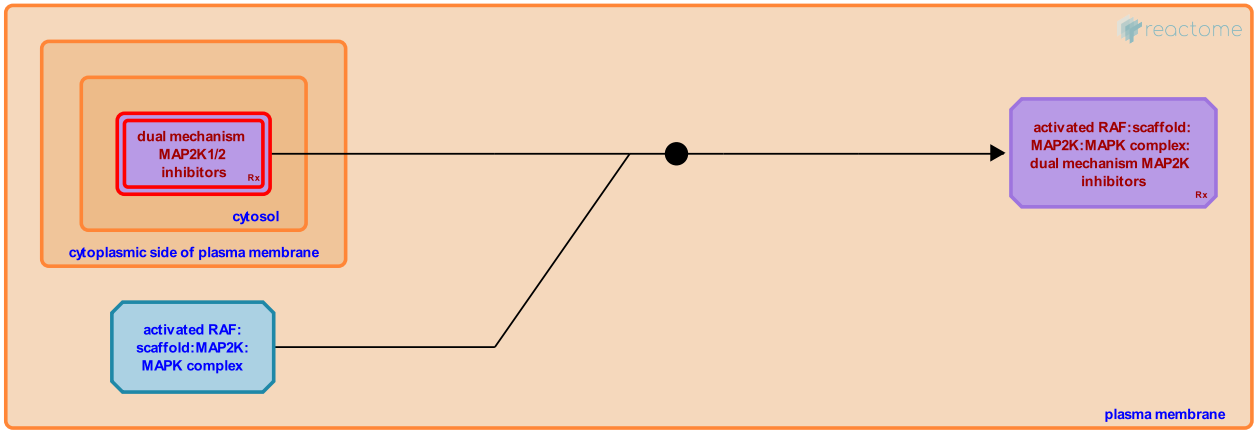
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-9657599

Type: binding

Compartments: plasma membrane, cytosol

Inferred from: Dual mechanism MAP2K inhibitors bind MAP2Ks (Homo sapiens)



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Preceded by: MAP2Ks and MAPKs bind to the activated RAF complex

RAF phosphorylates MAP2K dimer ↗

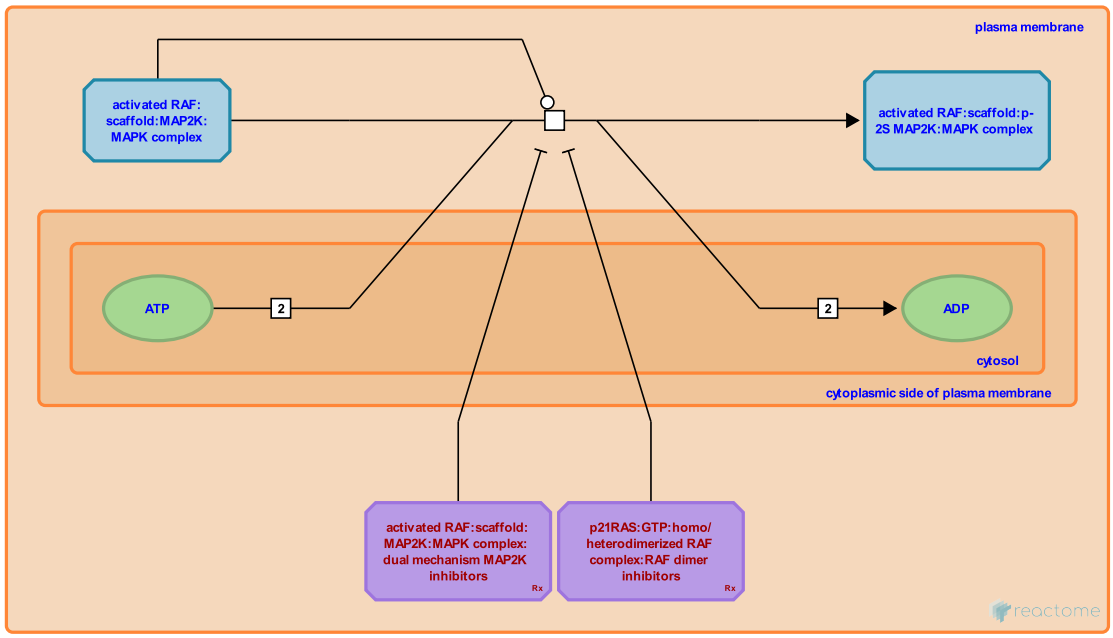
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-5672978

Type: transition

Compartments: plasma membrane

Inferred from: RAF phosphorylates MAP2K dimer (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: MAP2Ks and MAPKs bind to the activated RAF complex

Followed by: Single mechanism MAP2K inhibitors bind phosphorylated MAP2Ks, Dual mechanism MAPK inhibitors bind MAPKs, MAP2Ks phosphorylate MAPKs

Single mechanism MAP2K inhibitors bind phosphorylated MAP2Ks ↗

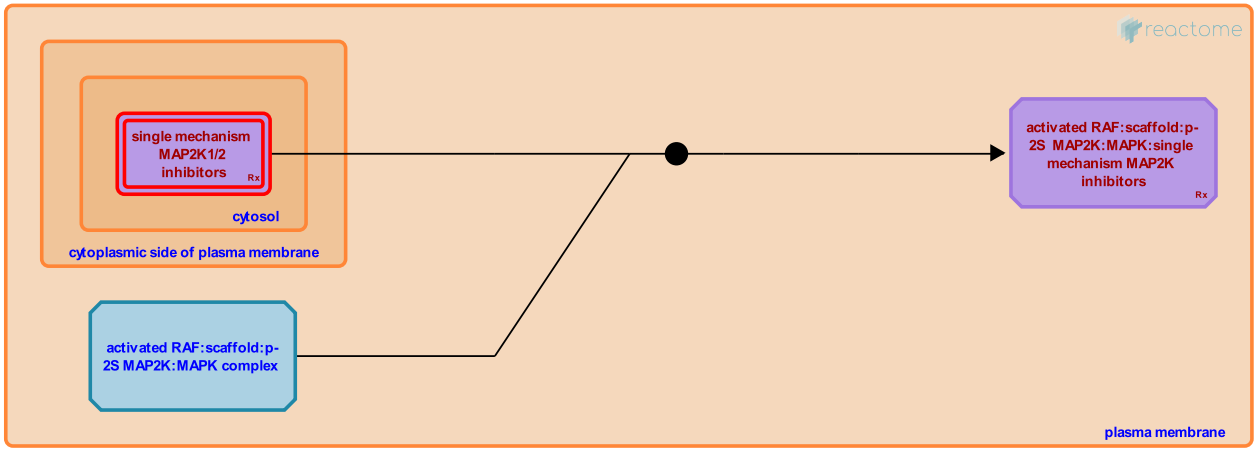
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-9657606

Type: binding

Compartments: plasma membrane, cytosol

Inferred from: Single mechanism MAP2K inhibitors bind phosphorylated MAP2Ks (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. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Preceded by: RAF phosphorylates MAP2K dimer

Dual mechanism MAPK inhibitors bind MAPKs ↗

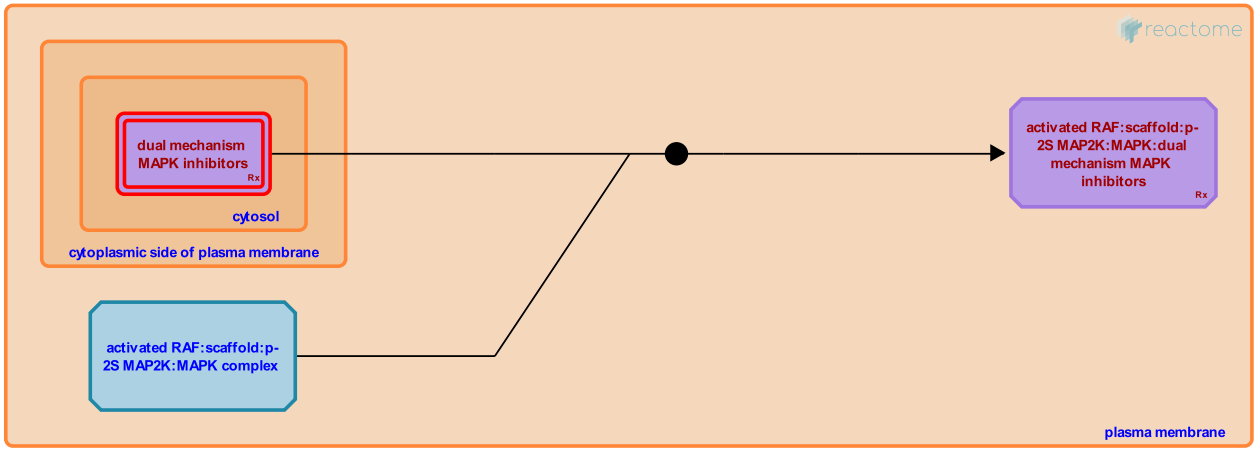
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-9657603

Type: binding

Compartments: plasma membrane, cytosol

Inferred from: Dual mechanism MAPK inhibitors bind MAPKs (Homo sapiens)



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More details and caveats of the event inference in Reactome. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Preceded by: RAF phosphorylates MAP2K dimer

MAP2Ks phosphorylate MAPKs ↗

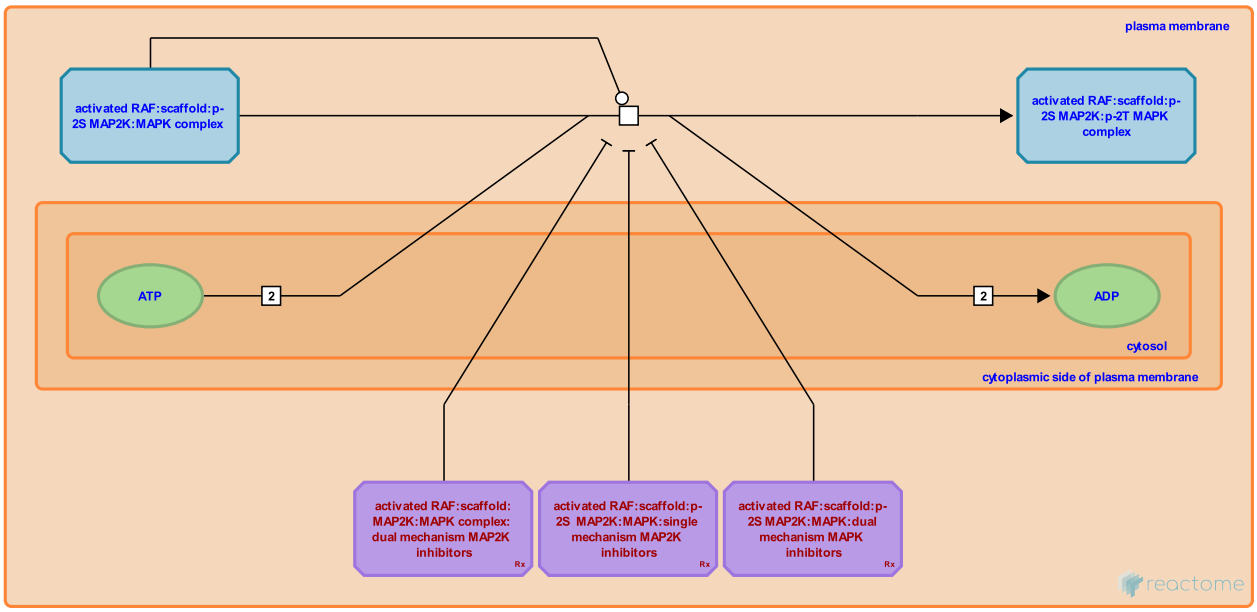
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-5672973

Type: transition

Compartments: plasma membrane

Inferred from: MAP2Ks phosphorylate MAPKs (Homo sapiens)



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More details and caveats of the event inference in Reactome. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Preceded by: RAF phosphorylates MAP2K dimer

Followed by: Single mechanism MAPK inhibitors bind phosphorylated MAPK, Dissociation of RAS:RAF complex

Dissociation of RAS:RAF complex ↗

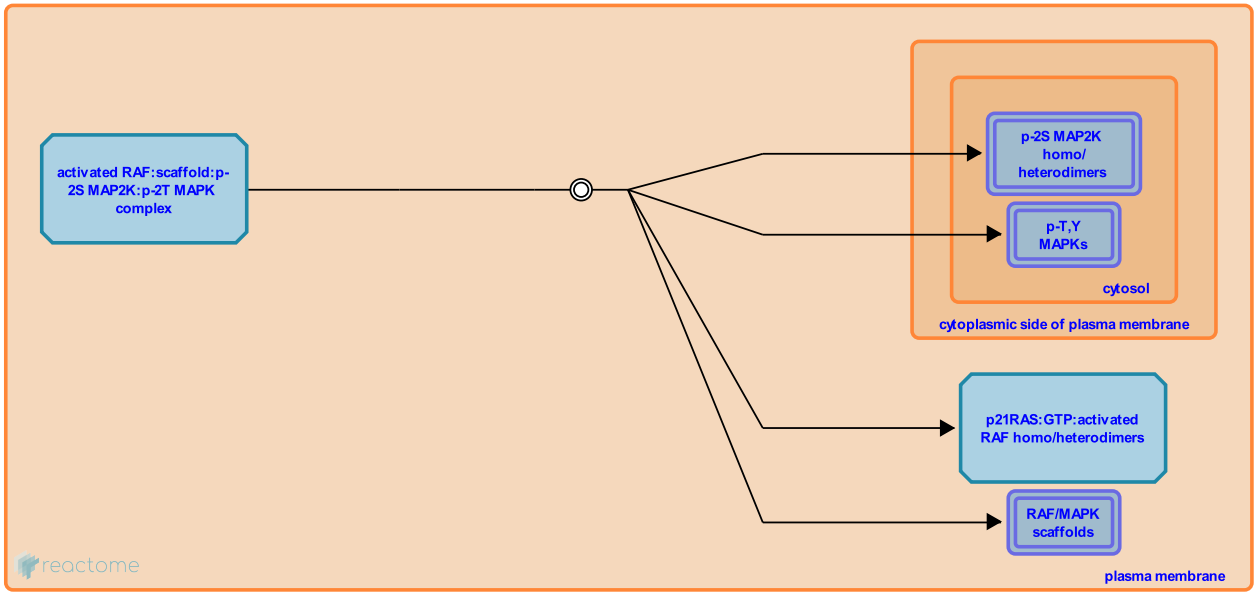
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-5672980

Type: dissociation

Compartments: plasma membrane

Inferred from: Dissociation of RAS:RAF complex (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. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Preceded by: MAP2Ks phosphorylate MAPKs

Followed by: IL17RD binds p-2S MAP2Ks and MAPKs

Single mechanism MAPK inhibitors bind phosphorylated MAPK ↗

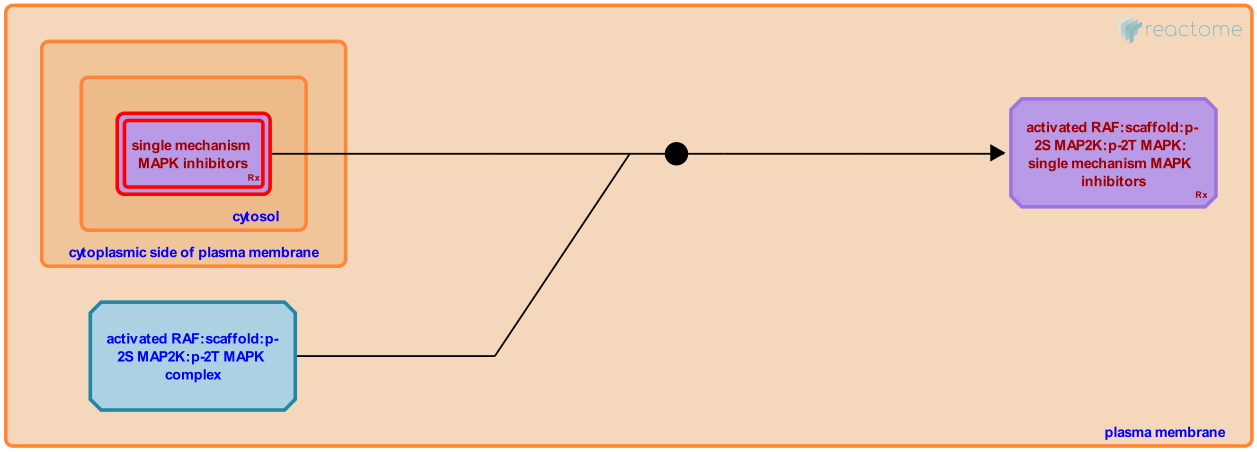
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-9657608

Type: binding

Compartments: plasma membrane, cytosol

Inferred from: Single mechanism MAPK inhibitors bind phosphorylated MAPK (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. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Preceded by: MAP2Ks phosphorylate MAPKs

WDR83:LAMTOR2:LAMTOR3 binds MAPK components ↗

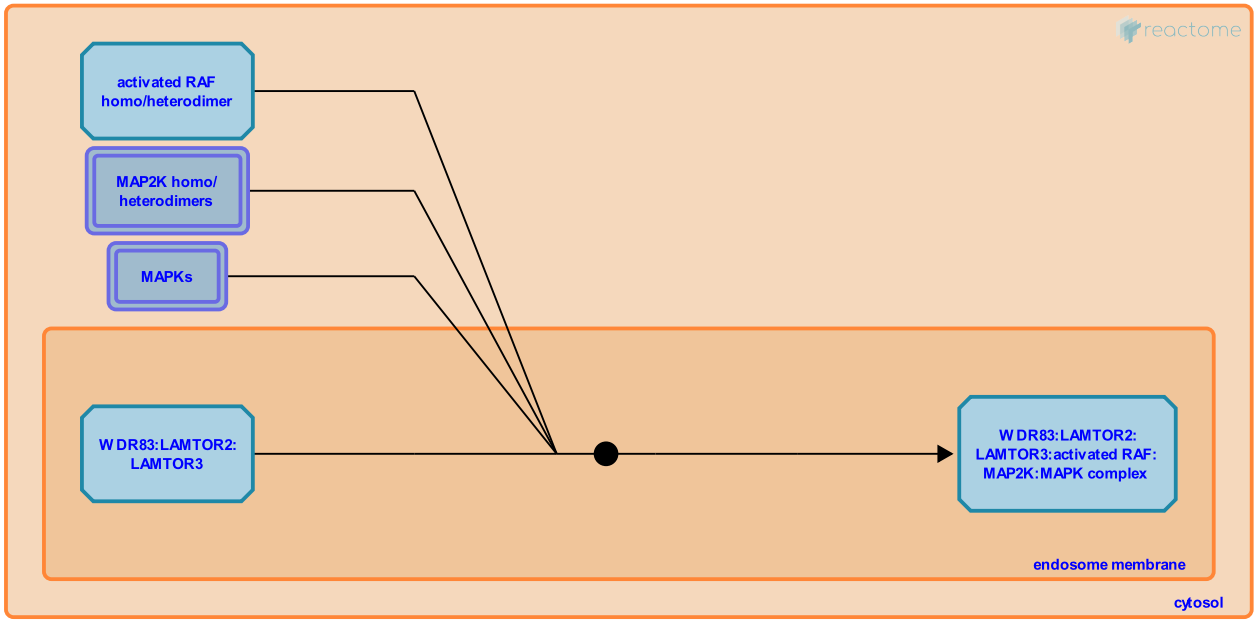
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-5674132

Type: binding

Compartments: endosome membrane

Inferred from: WDR83:LAMTOR2:LAMTOR3 binds MAPK components (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. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Followed by: MAP2Ks and MAPKs are phosphorylated at the endosome membrane

MAP2Ks and MAPKs are phosphorylated at the endosome membrane ↗

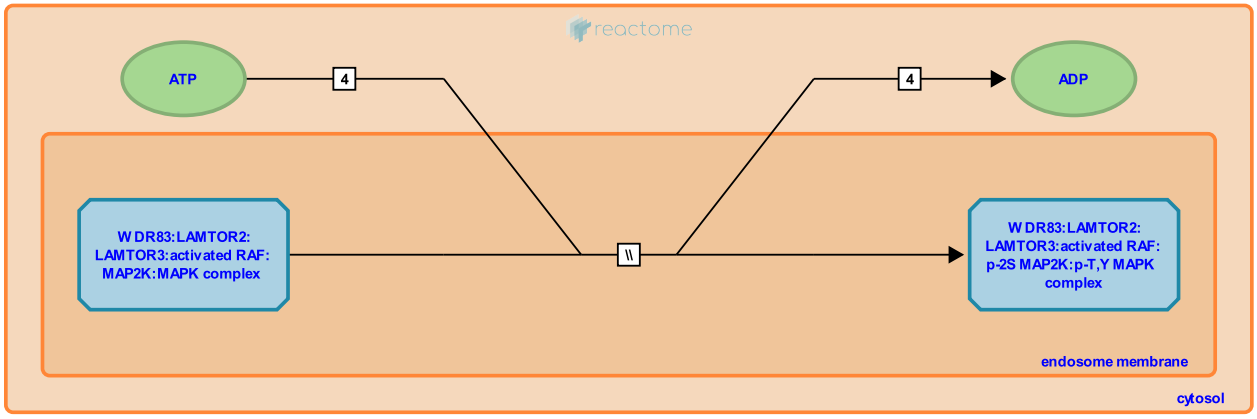
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-5674130

Type: omitted

Compartments: endosome membrane

Inferred from: MAP2Ks and MAPKs are phosphorylated at the endosome membrane (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. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Preceded by: WDR83:LAMTOR2:LAMTOR3 binds MAPK components

IL17RD binds p-2S MAP2Ks and MAPKs ↗

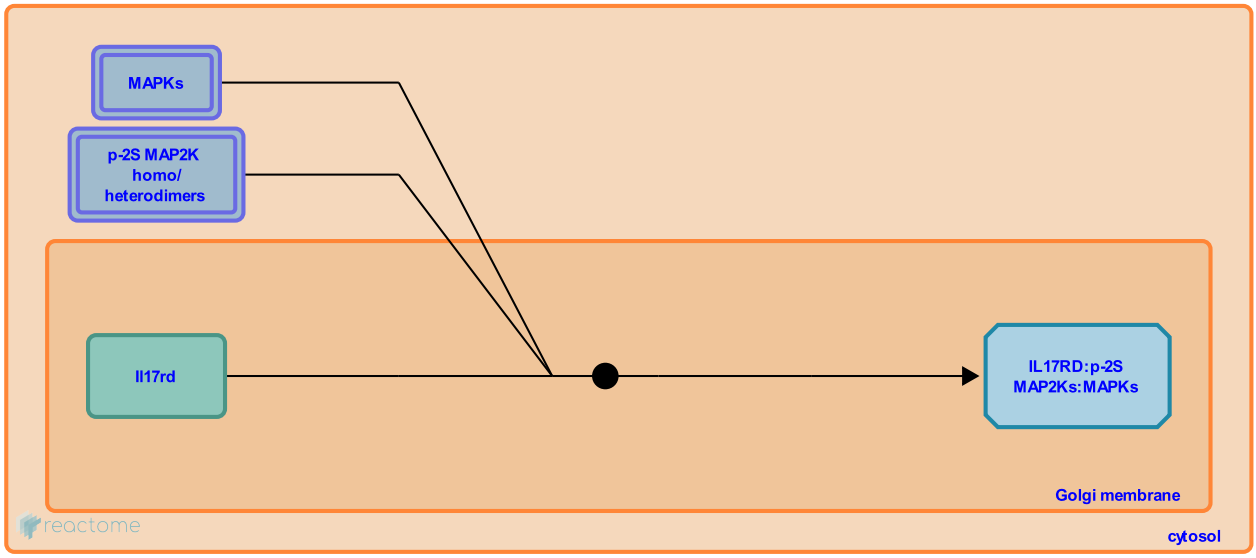
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-5674366

Type: binding

Compartments: Golgi membrane

Inferred from: IL17RD binds p-2S MAP2Ks and MAPKs (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. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Preceded by: Dissociation of RAS:RAF complex

Followed by: MAP2Ks phosphorylate MAPK at the Golgi membrane

MAP2Ks phosphorylate MAPK at the Golgi membrane ↗

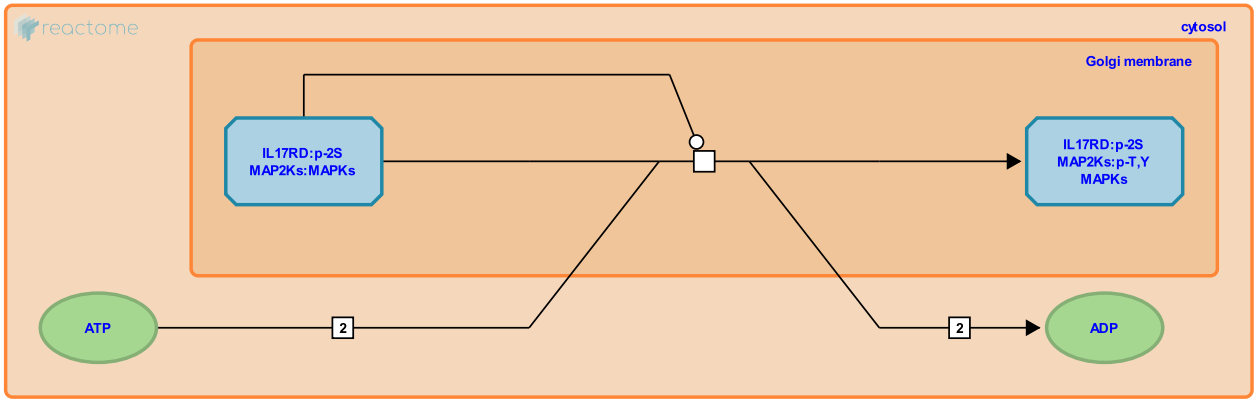
Location: MAP2K and MAPK activation

Stable identifier: R-RNO-5674373

Type: transition

Compartments: Golgi membrane

Inferred from: MAP2Ks phosphorylate MAPK at the Golgi membrane (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. For details on PANTHER see also: http://www.pantherdb.org/about.jsp

Preceded by: IL17RD binds p-2S MAP2Ks and MAPKs

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