CD28 dependent PI3K/Akt signaling

15/09/2021

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. ↗
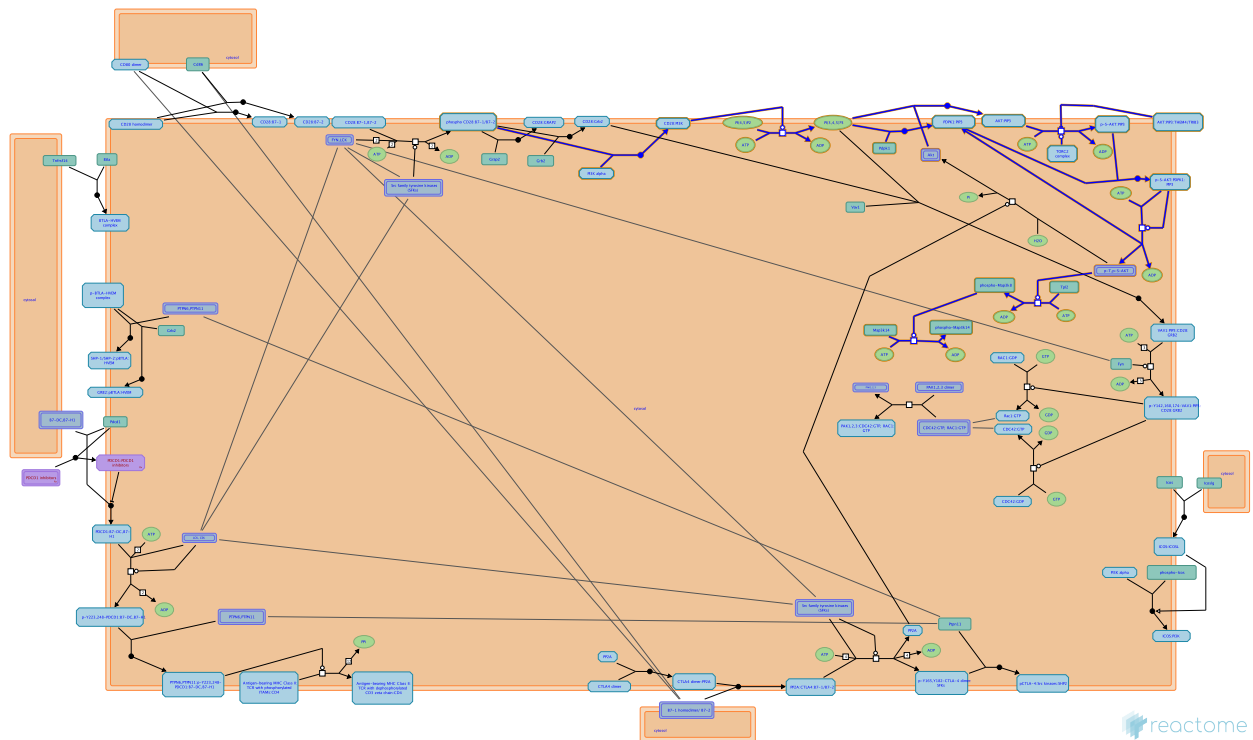
Reactome database release: 77

This document contains 1 pathway and 9 reactions (see Table of Contents)

CD28 dependent PI3K/Akt signaling ↗

Stable identifier: R-RNO-389357

Inferred from: CD28 dependent PI3K/Akt signaling (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.

<a href='/electronic_inference_compara.html' target = 'NEW'>More details and caveats of the event inference in Reactome. For details on PANTHER see also: <a href='http://www.pantherdb.org/about.jsp' target='NEW'>http://www.pantherdb.org/about.jsp
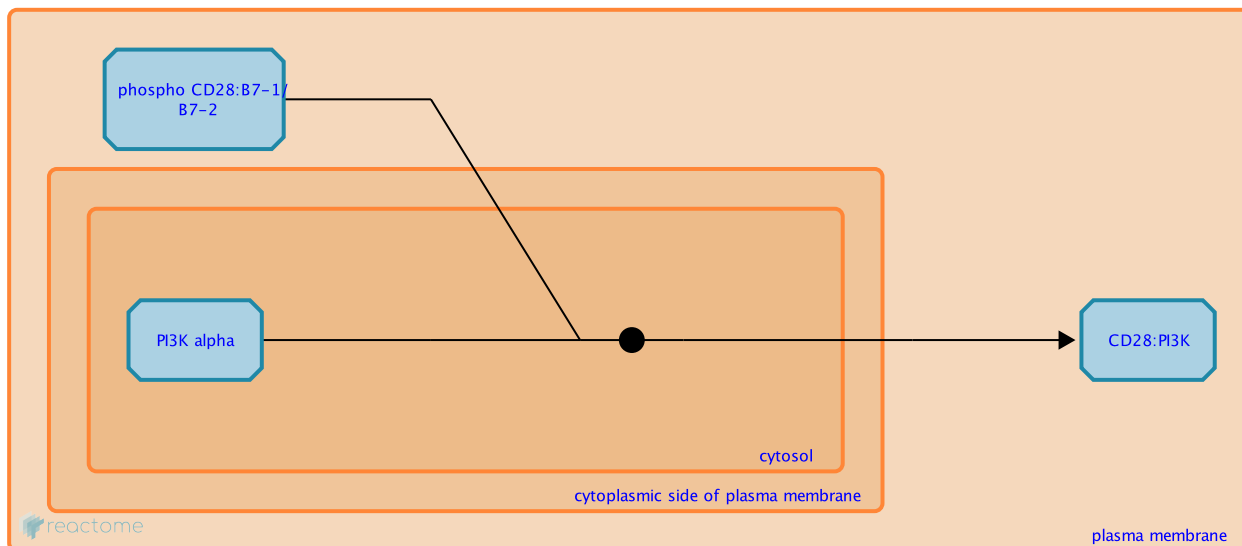
PI3K binds CD28 ↗

Location: CD28 dependent PI3K/Akt signaling

Stable identifier: R-RNO-388832

Type: binding

Compartments: cytosol, plasma membrane

Inferred from: PI3K binds CD28 (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: CD28 bound PI3K phosphorylates PIP2 to PIP3

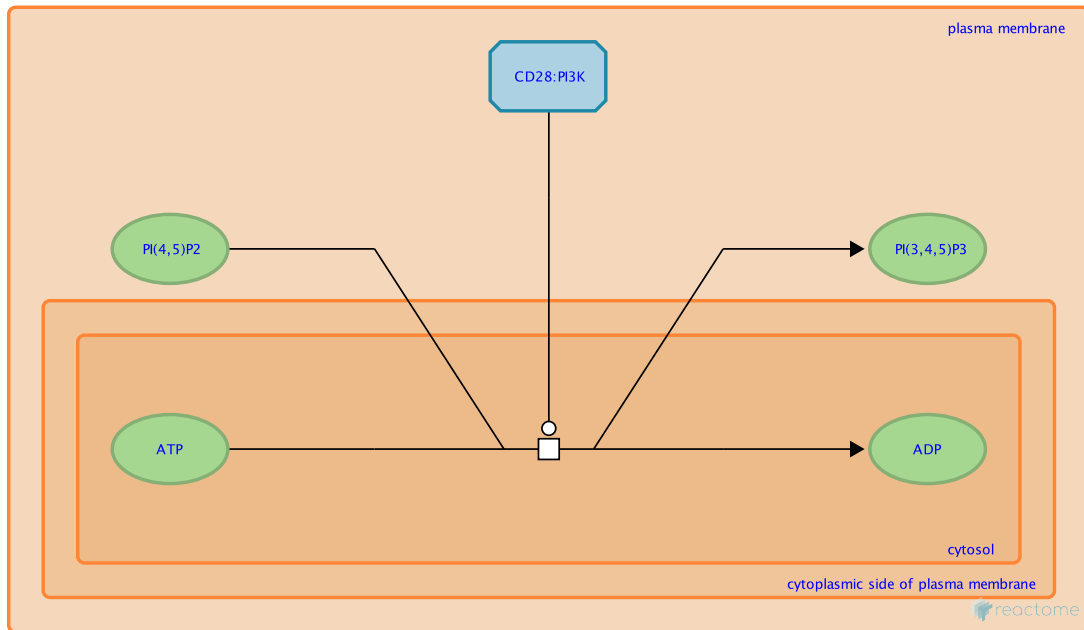# CD28 bound PI3K phosphorylates PIP2 to PIP3 ↗

Location: CD28 dependent PI3K/Akt signaling

Stable identifier: R-RNO-389158

Type: transition

Compartments: cytosol, plasma membrane

Inferred from: CD28 bound PI3K phosphorylates PIP2 to PIP3 (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.

<a href='/electronic_inference_compara.html' target = 'NEW'>More details and caveats of the event inference in Reactome. For details on PANTHER see also: <a href='http://www.pantherdb.org/about.jsp' target='NEW'>http://www.pantherdb.org/about.jsp

Preceded by: PI3K binds CD28

Followed by: PIP3 recruits AKT to the membrane, PIP3 recruits PDPK1 to the membrane
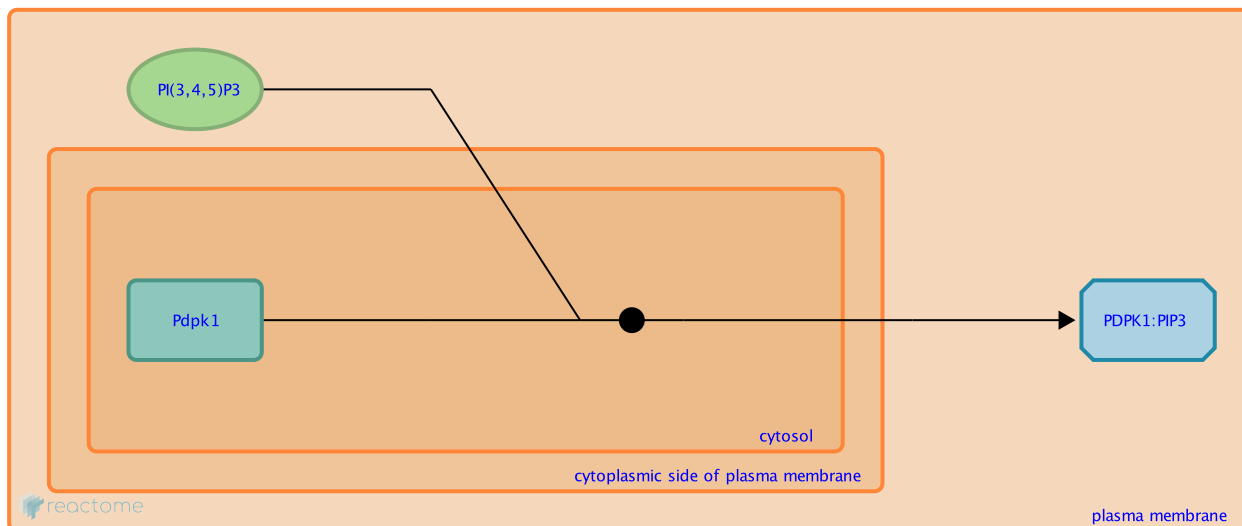
PIP3 recruits PDPK1 to the membrane ↗

Location: CD28 dependent PI3K/Akt signaling

Stable identifier: R-RNO-2316429

Type: binding

Compartments: cytosol, plasma membrane

Inferred from: PIP3 recruits PDPK1 to the 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.

<a href='/electronic_inference_compara.html' target = 'NEW'>More details and caveats of the event inference in Reactome. For details on PANTHER see also: <a href='http://www.pantherdb.org/about.jsp' target='NEW'>http://www.pantherdb.org/about.jsp

Preceded by: CD28 bound PI3K phosphorylates PIP2 to PIP3

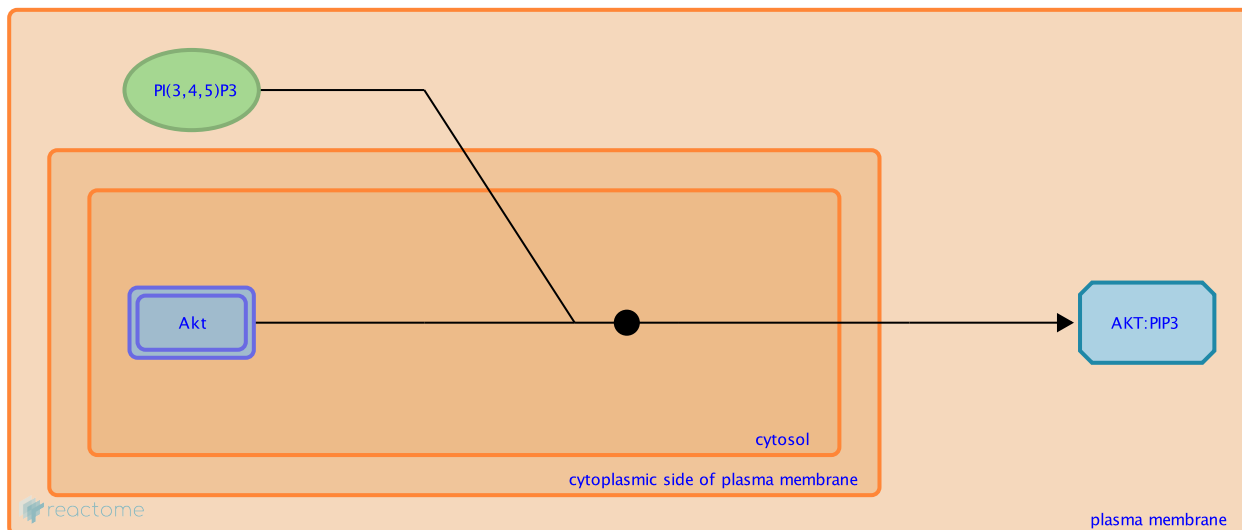**Followed by:** AKT binds PDPK1

PIP3 recruits AKT to the membrane ↗

Location: CD28 dependent PI3K/Akt signaling

Stable identifier: R-RNO-2317332

Type: binding

Compartments: cytosol, plasma membrane

Inferred from: PIP3 recruits AKT to the 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.

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Preceded by: CD28 bound PI3K phosphorylates PIP2 to PIP3

Followed by: TORC2 (mTOR) phosphorylates AKT at S473
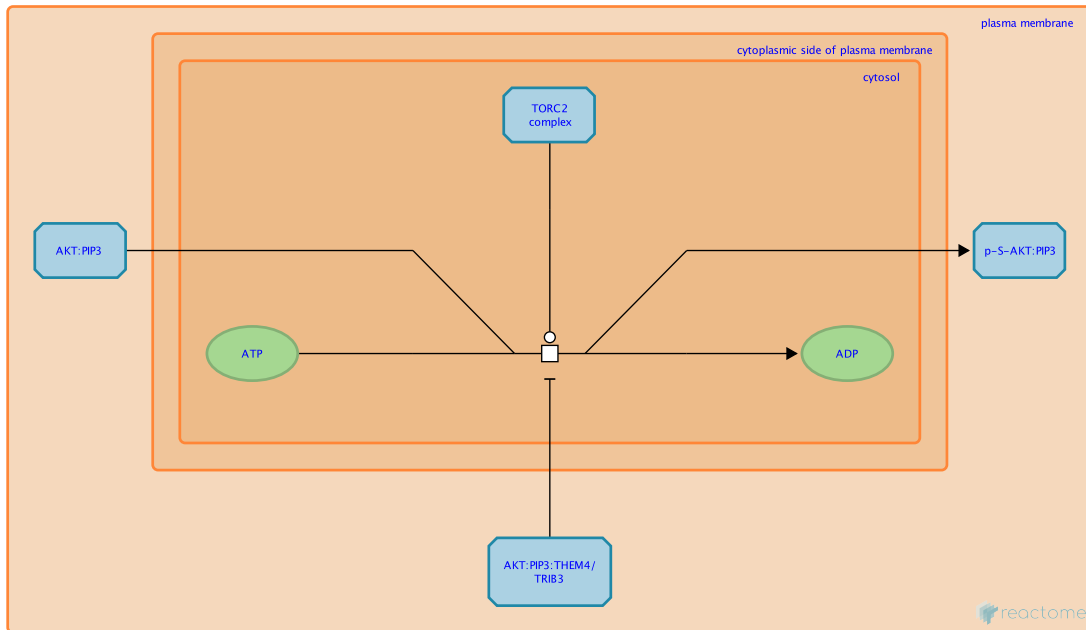
TORC2 (mTOR) phosphorylates AKT at S473 ↗

Location: CD28 dependent PI3K/Akt signaling

Stable identifier: R-RNO-198640

Type: transition

Compartments: cytosol, plasma membrane

Inferred from: TORC2 (mTOR) phosphorylates AKT at S473 (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: PIP3 recruits AKT to the membrane
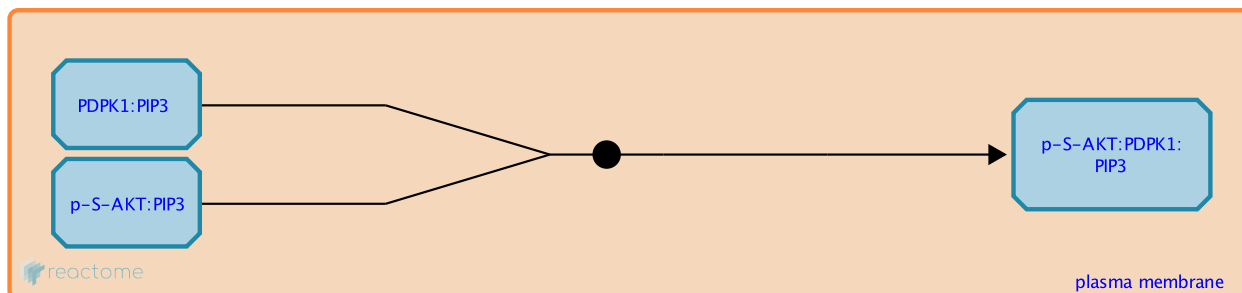
Followed by: AKT binds PDPK1

AKT binds PDPK1 ↗

Location: CD28 dependent PI3K/Akt signaling

Stable identifier: R-RNO-2317314

Type: binding

Compartments: plasma membrane

Inferred from: AKT binds PDPK1 (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: PIP3 recruits PDPK1 to the membrane, TORC2 (mTOR) phosphorylates AKT at S473

Followed by: PDPK1 phosphorylates AKT at T308

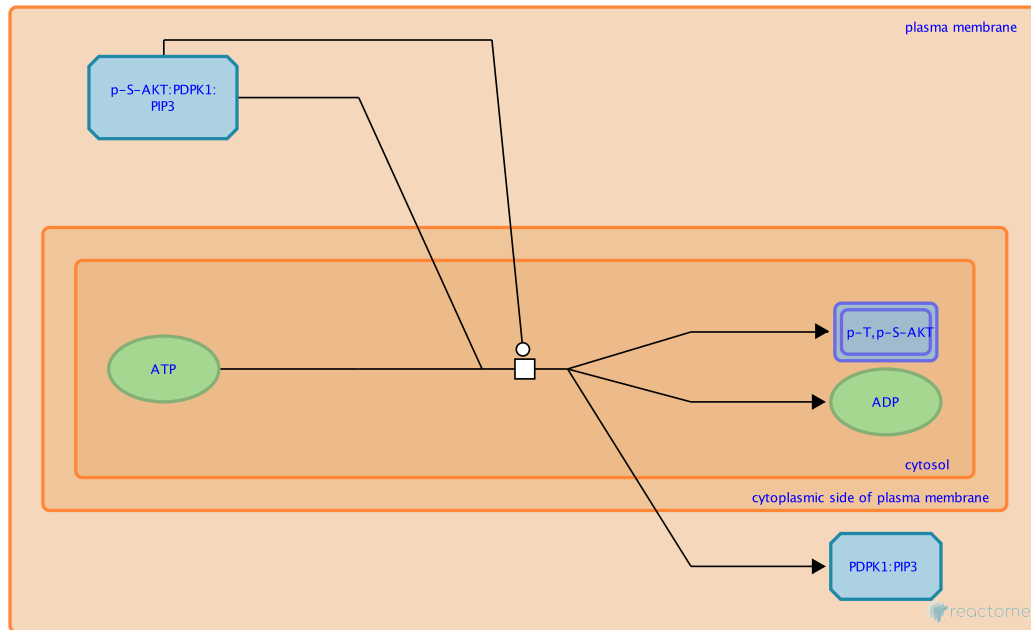## PDPK1 phosphorylates AKT at T308 ↗

Location: CD28 dependent PI3K/Akt signaling

Stable identifier: R-RNO-198270

Type: transition

Compartments: cytosol, plasma membrane

Inferred from: PDPK1 phosphorylates AKT at T308 (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.

<a href='/electronic_inference_compara.html' target = 'NEW'>More details and caveats of the event inference in Reactome. For details on PANTHER see also: <a href='http://www.pantherdb.org/about.jsp' target='NEW'>http://www.pantherdb.org/about.jsp

Preceded by: AKT binds PDPK1

Followed by: AKT interacts and phosphorylates Cot
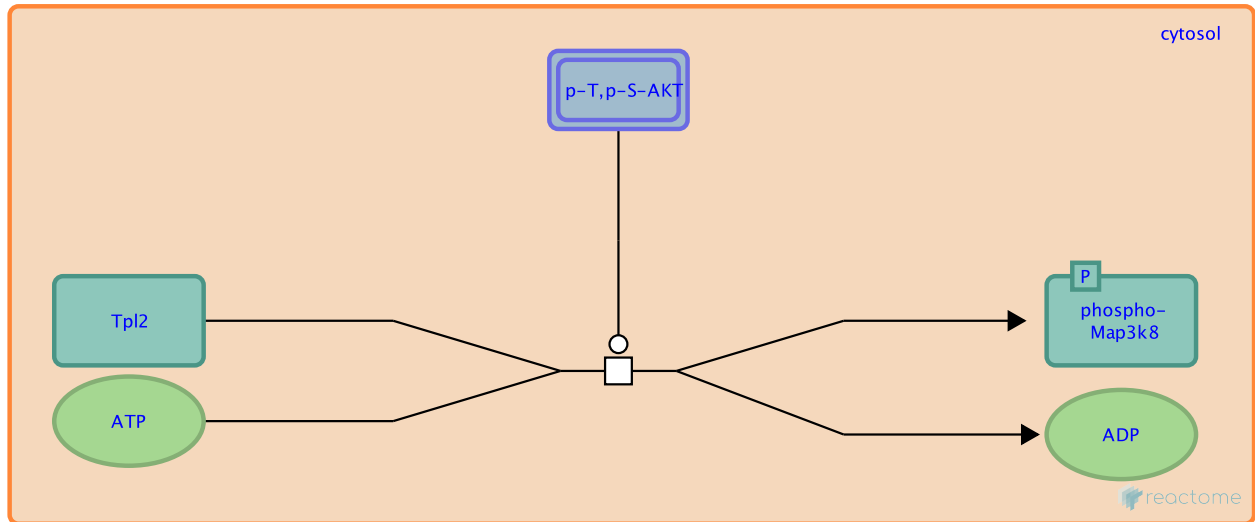
AKT interacts and phosphorylates Cot ↗

Location: CD28 dependent PI3K/Akt signaling

Stable identifier: R-RNO-389756

Type: transition

Compartments: cytosol

Inferred from: AKT interacts and phosphorylates Cot (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: PDPK1 phosphorylates AKT at T308

Followed by: p-S400-Cot phosphorylates NIK
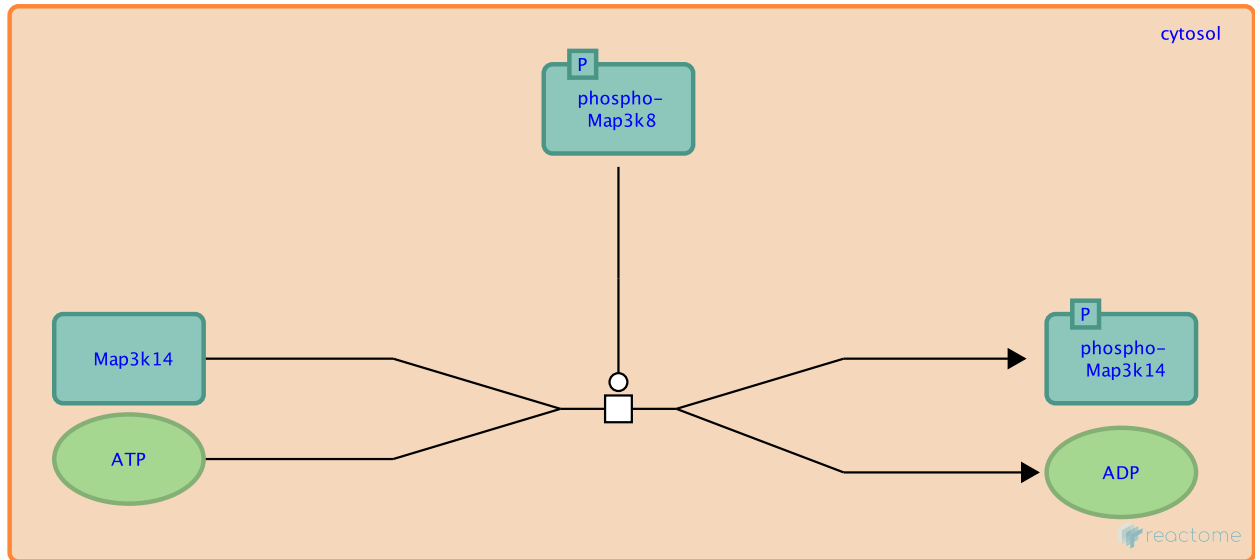
p-S400-Cot phosphorylates NIK ↗

Location: CD28 dependent PI3K/Akt signaling

Stable identifier: R-RNO-392530

Type: transition

Compartments: cytosol

Inferred from: p-S400-Cot phosphorylates NIK (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.

<a href='/electronic_inference_compara.html' target = 'NEW'>More details and caveats of the event inference in Reactome. For details on PANTHER see also: <a href='http://www.pantherdb.org/about.jsp' target='NEW'>http://www.pantherdb.org/about.jsp

Preceded by: AKT interacts and phosphorylates Cot

Table of Contents