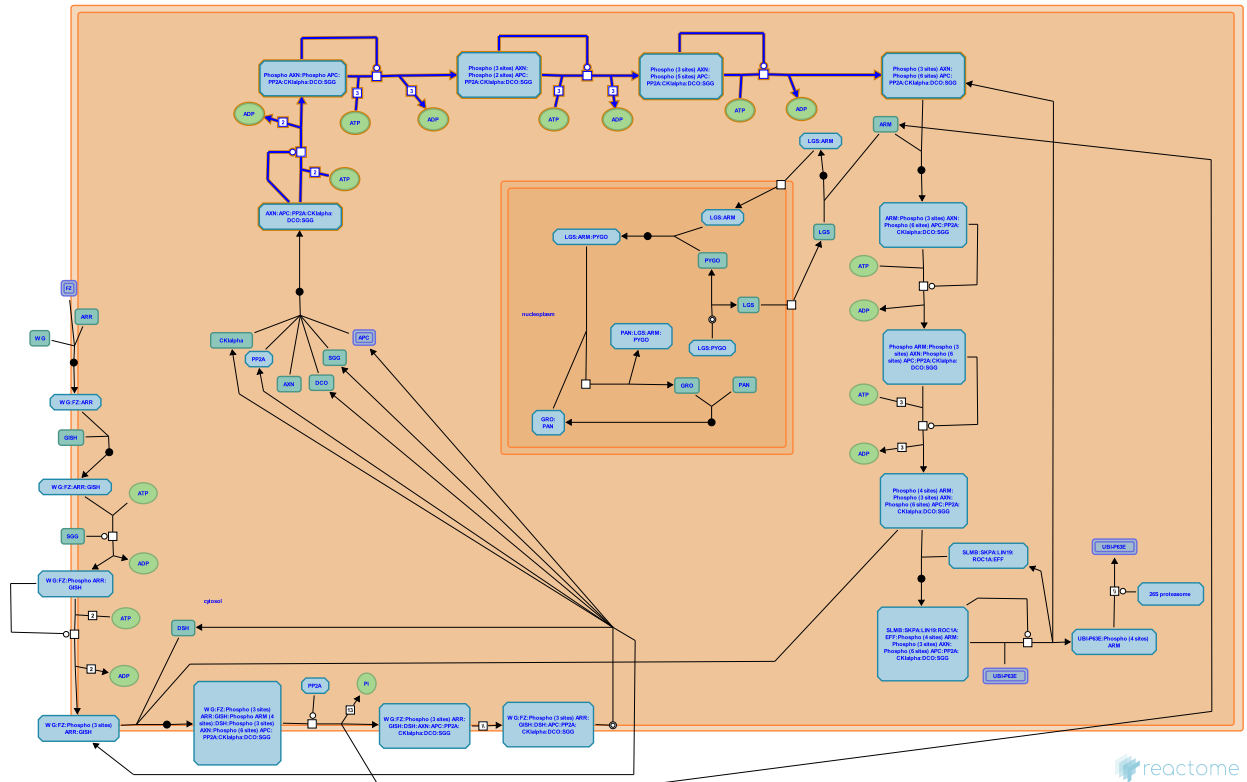


Phosphorylation of AXN and APC



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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).

06/05/2024

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

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- 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. [↗](#)

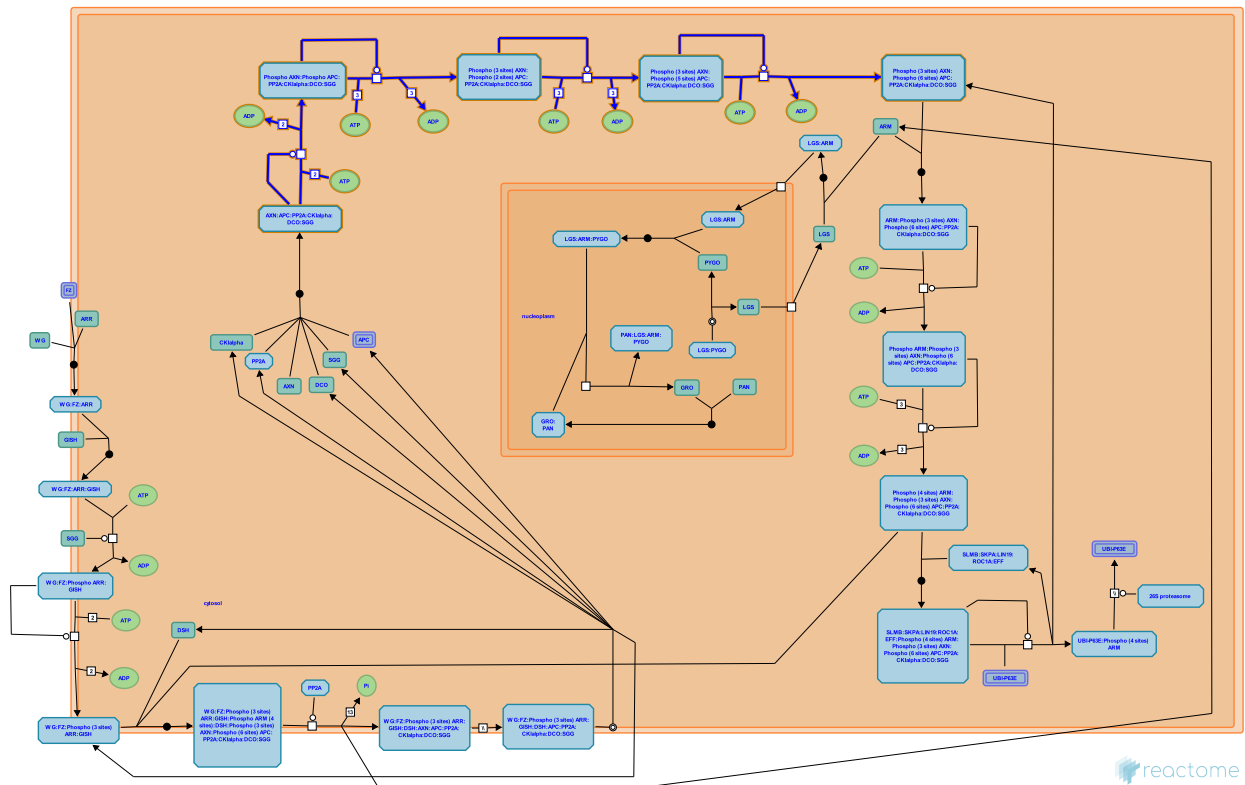
Reactome database release: 88

This document contains 1 pathway and 4 reactions ([see Table of Contents](#))

Phosphorylation of AXN and APC [↗](#)

Stable identifier: R-DME-209155

Compartments: cytosol



Spatzle (SPZ) dimer binding leads to Toll (TL) receptor homodimerisation and activation.

Literature references

Tolwinski, NS., Wieschaus, E. (2004). Rethinking Wnt signaling. *Trends Genet*, 20, 177-81. [↗](#)

Kikuchi, A., Yamamoto, H., Kishida, S. (2006). Regulation of Wnt signaling by protein-protein interaction and post-translational modifications. *Exp Mol Med*, 38, 1-10. [↗](#)

Logan, CY., Nusse, R. (2004). The Wnt signaling pathway in development and disease. *Annu Rev Cell Dev Biol*, 20, 781-810. [↗](#)

Editions

2006-07-26	Authored, Edited	Williams, MG.
2008-01-19	Reviewed	Nusse, R.

Phosphorylation of AXN and APC by DCO ↗

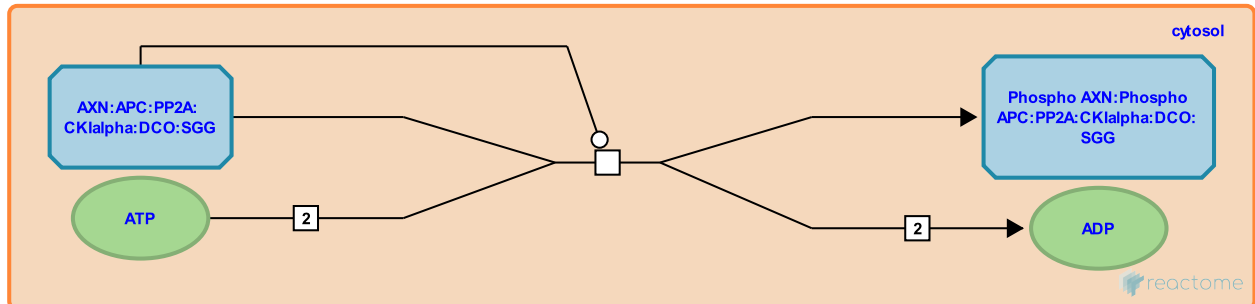
Location: [Phosphorylation of AXN and APC](#)

Stable identifier: R-DME-209143

Type: transition

Compartments: cytosol

Inferred from: [Human APC is initially phosphorylated by Murine CKIepsilon \(Homo sapiens\)](#)



Axin (AXN) and APC (APC/APC2) in the 'destruction complex' are primed for phosphorylation by the CKIepsilon orthologue DCO. Ser1505 in Human APC and Ser531 in Human Axin (equivalent to Ser621 in Mouse and Ser529 in Fly) are phosphorylated.

Followed by: [Phosphorylation of AXN and APC by SGG](#)

Editions

2006-07-26	Authored	Williams, MG.
2008-01-19	Reviewed	Nusse, R.
2014-05-20	Edited	Williams, MG.

Phosphorylation of AXN and APC by SGG ↗

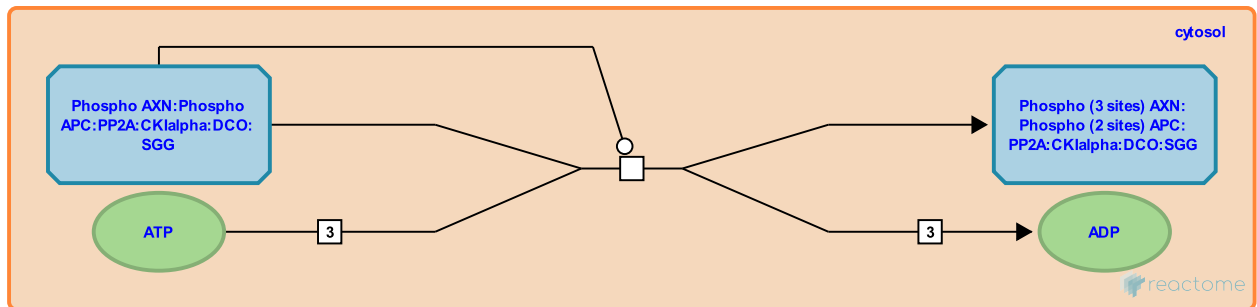
Location: Phosphorylation of AXN and APC

Stable identifier: R-DME-209049

Type: transition

Compartments: cytosol

Inferred from: Murine Axin1 is further phosphorylated by Human GSK3beta (Mus musculus), Human APC is further phosphorylated by Murine GSK3beta (Homo sapiens)



Additional phosphorylation of the scaffolding molecules, Axin (AXN) and APC (APC/APC2), is carried out by the GSK3beta kinase orthologue Shaggy (SGG) with Ser1501 (also a priming phosphorylation) in Human APC and Ser614 and Thr609 in Mouse Axin (equivalent to Ser522 and Thr517 respectively in Fly and Ser524 and Thr519 in Human).

Preceded by: Phosphorylation of AXN and APC by DCO

Followed by: Further phosphorylation of APC by DCO

Editions

2006-07-26	Authored	Williams, MG.
2008-01-19	Reviewed	Nusse, R.
2014-05-20	Edited	Williams, MG.

Further phosphorylation of APC by DCO ↗

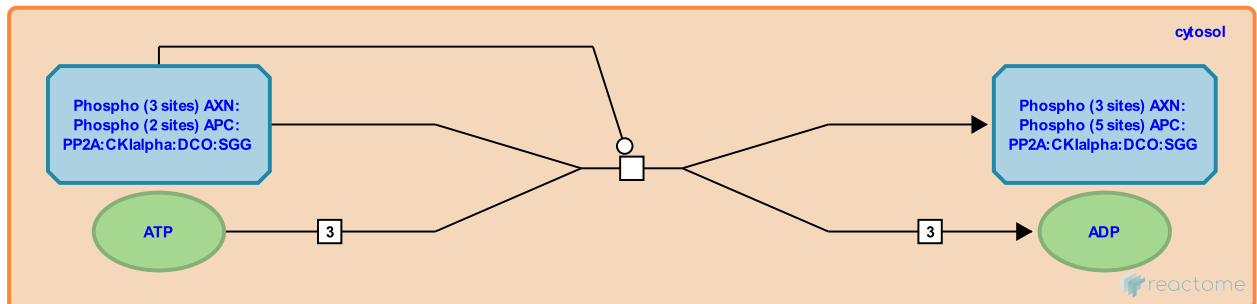
Location: Phosphorylation of AXN and APC

Stable identifier: R-DME-209107

Type: transition

Compartments: cytosol

Inferred from: Human APC is further phosphorylated by Murine CKIepsilon (Homo sapiens)



Three Serine residues in APC (APC/APC2) are further phosphorylated by DCO. Ser1504, Ser1507 (priming), and Ser1510 in Human APC are further phosphorylated by CKIepsilon.

Preceded by: Phosphorylation of AXN and APC by SGG

Followed by: Further phosphorylation of APC by SGG

Editions

2006-07-26	Authored	Williams, MG.
2008-01-19	Reviewed	Nusse, R.
2014-05-20	Edited	Williams, MG.

Further phosphorylation of APC by SGG ↗

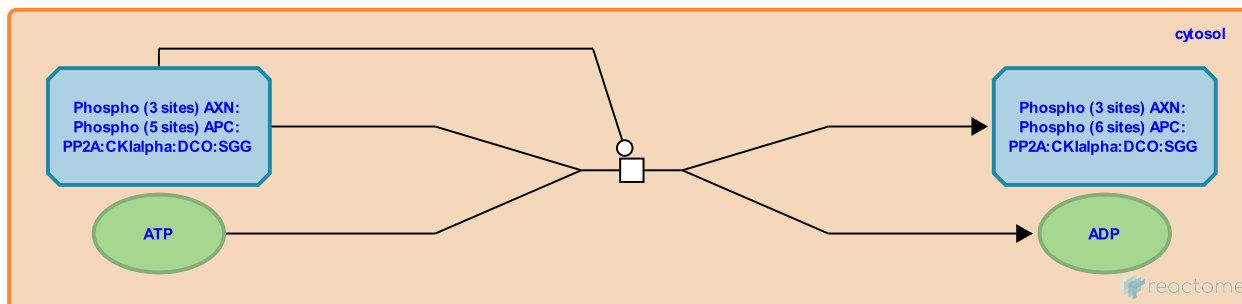
Location: Phosphorylation of AXN and APC

Stable identifier: R-DME-209082

Type: transition

Compartments: cytosol

Inferred from: Human APC is finally phosphorylated by Murine GSK3beta (Homo sapiens)



A Serine in APC (APC/APC2) is further phosphorylated by Shaggy (SGG). Ser1503 in Human APC is phosphorylated by GSK3beta.

Preceded by: Further phosphorylation of APC by DCO

Editions

2006-07-26	Authored	Williams, MG.
2008-01-19	Reviewed	Nusse, R.
2014-05-20	Edited	Williams, MG.

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