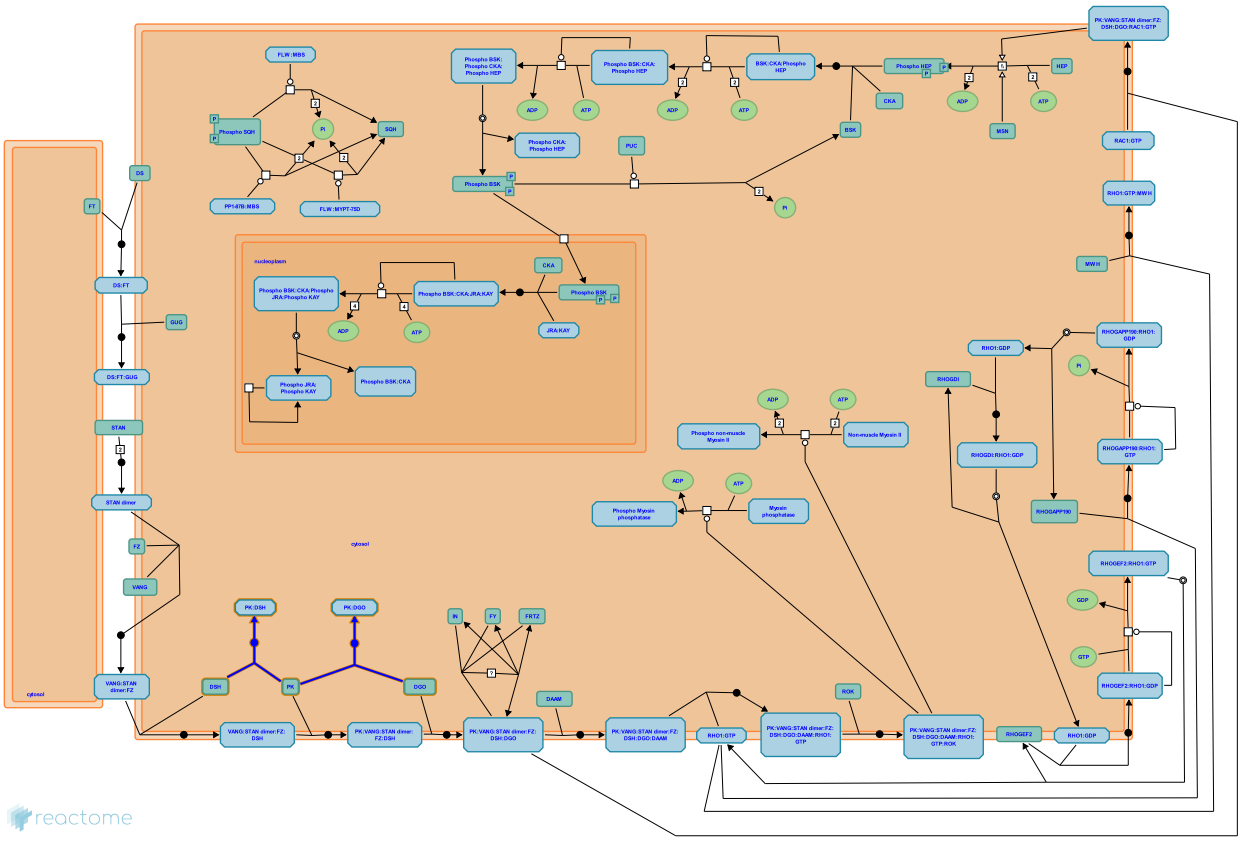
Negative feedback loop regulates asymmetric localisation



Axelrod, JD., Williams, MG.

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

19/05/2024

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. ↗

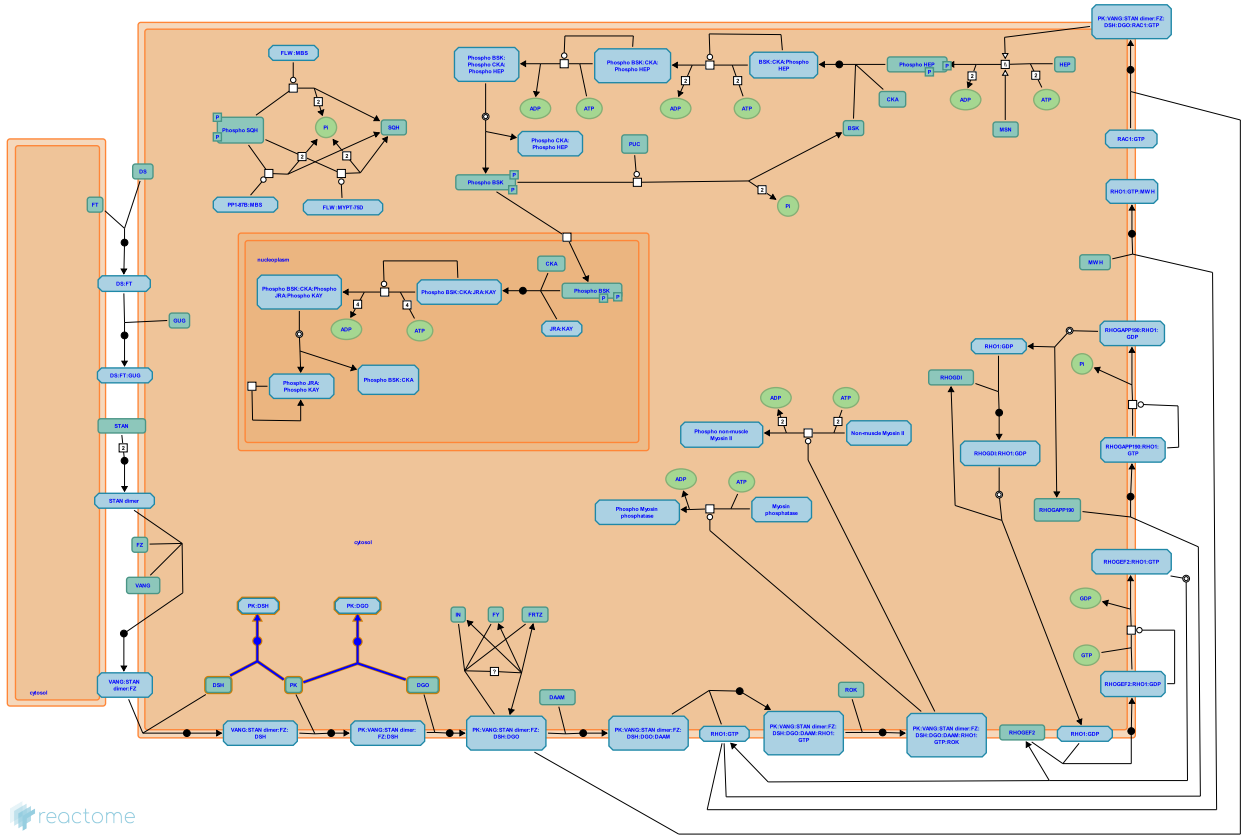
Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics, 33*, 3461-3467. ↗

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. ↗

Negative feedback loop regulates asymmetric localisation ↗

Stable identifier: R-DME-350369



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

Literature references

Zallen, JA. (2007). Planar polarity and tissue morphogenesis. *Cell, 129*, 1051-63. ↗

Casal, J., Struhl, G., Lawrence, PA. (2007). Planar cell polarity: one or two pathways?. *Nat Rev Genet, 8*, 555-63. ↗

Editions

2008-05-19	Edited	Williams, MG.
2008-05-20	Authored	Williams, MG.
2009-11-19	Reviewed	Axelrod, JD.

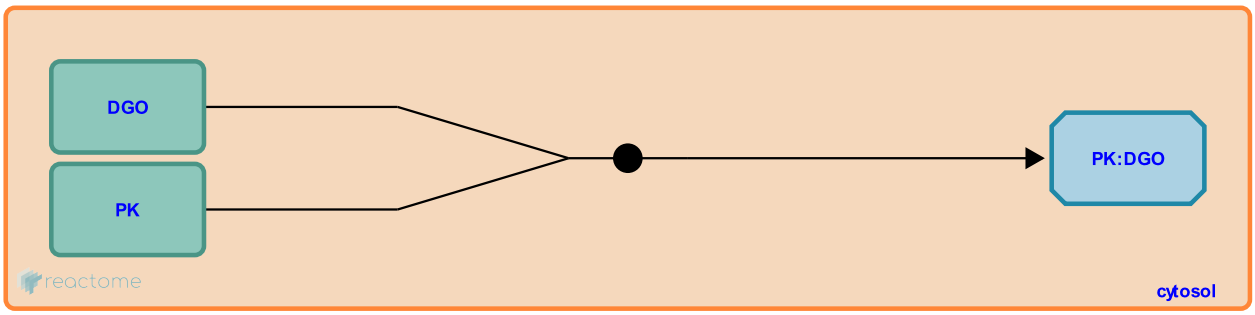
DGO binds to PK ↗

Location: Negative feedback loop regulates asymmetric localisation

Stable identifier: R-DME-350403

Type: binding

Compartments: cytosol



In the cytosol, Diego (DGO) can bind to Prickle (PK). This may result in there being less DGO to bind to and stabilise the Frizzled (FZ):Dishevelled (DSH) complex.

Literature references

Klein, TJ., Eaton, S., Jenny, A., Das, G., Mlodzik, M. (2004). Diego interacts with Prickle and Strabismus/Van Gogh to localize planar cell polarity complexes. *Development, 131*, 4467-76. ↗

Editions

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2014-05-20	Edited	Williams, MG.

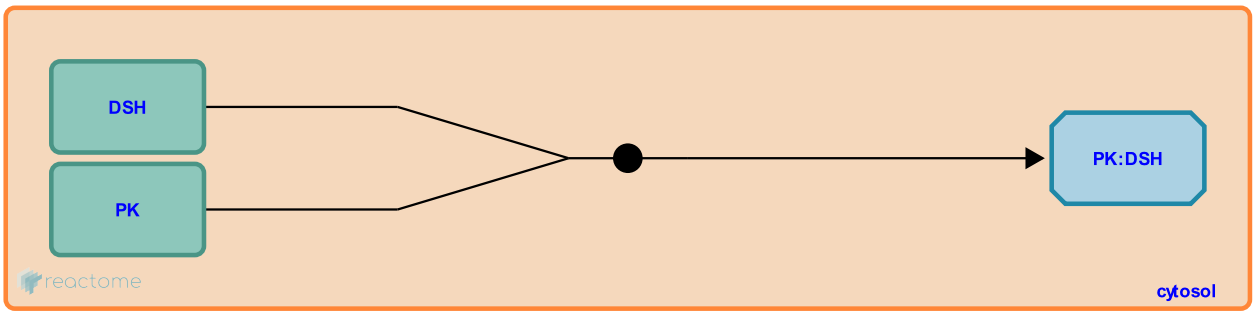
PK binds to DSH ↗

Location: Negative feedback loop regulates asymmetric localisation

Stable identifier: R-DME-350400

Type: binding

Compartments: cytosol



The PET/LIM domain of Prickle (PK) interacts with DEP domain and C-terminus of Dishevelled (DSH). The DEP domain is required by DSH for membrane localisation. Binding of Diego (DGO) and PK to DSH is mutually exclusive. PK binding to DSH prevents FZ PCP signalling.

Literature references

Burnett, M., Reynolds-Kenneally, J., Das, G., Jenny, A., Mlodzik, M. (2005). Diego and Prickle regulate Frizzled planar cell polarity signalling by competing for Dishevelled binding. *Nat Cell Biol, 7*, 691-7. ↗

Axelrod, JD., Tree, DR., Shulman, JM., Gubb, D., Scott, MP., Rousset, R. (2002). Prickle mediates feedback amplification to generate asymmetric planar cell polarity signaling. *Cell, 109*, 371-81. ↗

Editions

2008-05-20	Authored	Williams, MG.
2009-11-19	Reviewed	Axelrod, JD.
2014-05-20	Edited	Williams, MG.

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