

PI3P is dephosphorylated to PI by SYNJ/MTMs at the plasma membrane

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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: 74

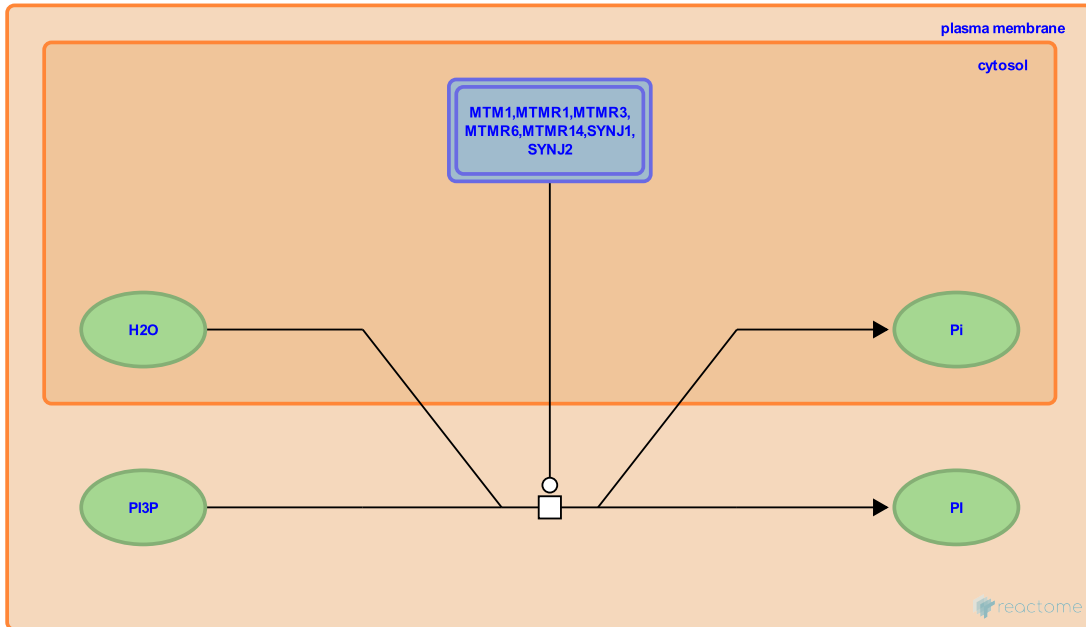
This document contains 1 reaction ([see Table of Contents](#))

PI3P is dephosphorylated to PI by SYNJ/MTMs at the plasma membrane ↗

Stable identifier: R-HSA-1675994

Type: transition

Compartments: plasma membrane, cytosol



At the plasma membrane, synaptojanin-1 aka Synaptic inositol-1,4,5-trisphosphate 5-phosphatase 1 (SYNJ1) (Guo et al. 1999), -2 (SYNJ2) and some myotubularins (MTMs) dephosphorylate phosphatidylinositol 3-phosphate (PI3P) to phosphatidylinositol (PI). The MTMs involved are: myotubularin (MTM1) (Cao et al. 2007, Tronchere et al. 2004, Schaletzky et al. 2003, Laporte et al. 2002, Kim et al. 2002) and myotubularin-related proteins 1 (MTMR1) (Kim et al. 2002, Tronchere et al. 2004), 3 (MTMR3) (Kim et al. 2002, Zhao et al. 2001, Walker et al. 2001, Lorenzo et al. 2005), 6 (MTMR6) (Schaletzky et al. 2003, Kim et al. 2002, Choudhury et al. 2006), and 14 (MTMR14) (Tosch et al. 2006).

Literature references

- Tosch, V., Rohde, HM., Tronchère, H., Zanoteli, E., Monroy, N., Kretz, C. et al. (2006). A novel PtdIns3P and PtdIns(3,5)P₂ phosphatase with an inactivating variant in centronuclear myopathy. *Hum Mol Genet*, 15, 3098-106. ↗
- Kim, SA., Taylor, GS., Torgersen, KM., Dixon, JE. (2002). Myotubularin and MTMR2, phosphatidylinositol 3-phosphatases mutated in myotubular myopathy and type 4B Charcot-Marie-Tooth disease. *J Biol Chem*, 277, 4526-31. ↗
- Cao, C., Laporte, J., Backer, JM., Wandering-Ness, A., Stein, MP. (2007). Myotubularin lipid phosphatase binds the hVPS15/hVPS34 lipid kinase complex on endosomes. *Traffic*, 8, 1052-67. ↗
- Guo, S., Stolz, LE., Lemrow, SM., York, JD. (1999). SAC1-like domains of yeast SAC1, INP52, and INP53 and of human synaptojanin encode polyphosphoinositide phosphatases. *J Biol Chem*, 274, 12990-5. ↗
- Schaletzky, J., Dove, SK., Short, B., Lorenzo, O., Clague, MJ., Barr, FA. (2003). Phosphatidylinositol-5-phosphate activation and conserved substrate specificity of the myotubularin phosphatidylinositol 3-phosphatases. *Curr Biol*, 13, 504-9. ↗

Editions

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