

Activated FGFR3:pFRS binds GRB2:SOS1

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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: 88

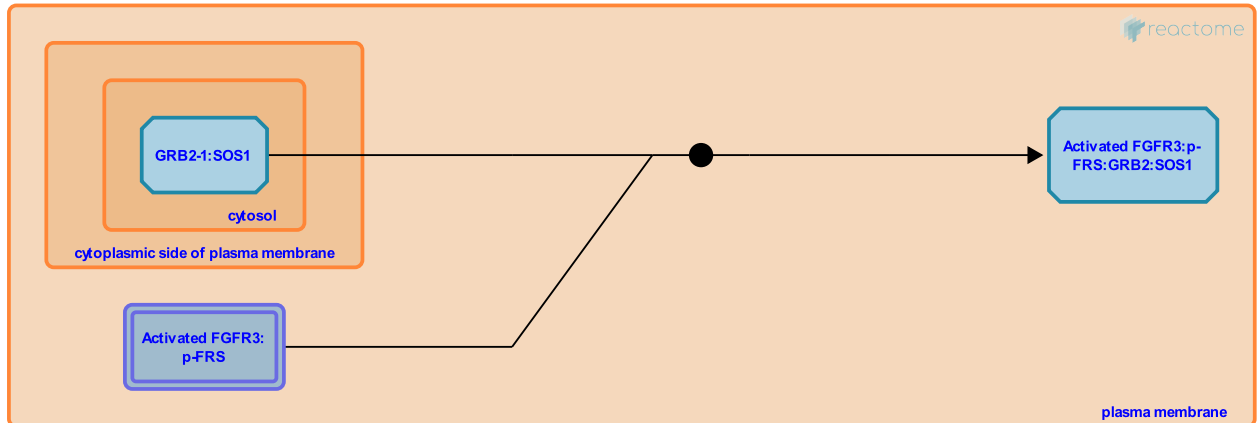
This document contains 1 reaction ([see Table of Contents](#))

Activated FGFR3:pFRS binds GRB2:SOS1 [↗](#)

Stable identifier: R-HSA-5654416

Type: binding

Compartments: cytosol, extracellular region, plasma membrane



Tyrosine phosphorylated FRS2 recruits GRB2:SOS1 complex by means of the SH3 domain of GRB2, leading to RAS-MAP kinase activation. The FRS2:GRB2-mediated pathway plays a minor role in the activation of RAS-MAP kinase pathway compared to that mediated by FRS2:PPTN11.

Literature references

- Schlessinger, J., Kouhara, H., Lax, I., Schilling, J., Spivak-Kroizman, T., Hadari, YR. et al. (1997). A lipid-anchored Grb2-binding protein that links FGF-receptor activation to the Ras/MAPK signaling pathway. *Cell*, 89, 693-702. [↗](#)
- Kanda, S., Klint, P., Claesson-Welsh, L. (1995). Shc and a novel 89-kDa component couple to the Grb2-Sos complex in fibroblast growth factor-2-stimulated cells. *J Biol Chem*, 270, 23337-44. [↗](#)
- Ong, SH., Schlessinger, J., Lax, I., Gotoh, N., Hadari, YR., Guy, GR. (2001). Stimulation of phosphatidylinositol 3-kinase by fibroblast growth factor receptors is mediated by coordinated recruitment of multiple docking proteins. *Proc Natl Acad Sci U S A*, 98, 6074-9. [↗](#)
- Schlessinger, J., Kouhara, H., Lax, I., Gotoh, N., Hadari, YR. (2001). Critical role for the docking-protein FRS2 alpha in FGF receptor-mediated signal transduction pathways. *Proc Natl Acad Sci U S A*, 98, 8578-83. [↗](#)
- Goh, KC., Lim, YP., Klint, P., Tan, YH., Low, BC., Ong, SH. et al. (1996). Suc1-associated neurotrophic factor target (SNT) protein is a major FGF-stimulated tyrosine phosphorylated 90-kDa protein which binds to the SH2 domain of GRB2. *Biochem Biophys Res Commun*, 225, 1021-6. [↗](#)

Editions

2011-08-15	Authored	Rothfels, K.
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