p-Y-Jak1,2 phosphorylates Stat1,3,5 in Csf3 dimer:2xp-4Y-Csf3r:Lyn:p-Y-Jak1:p-Jak2:p-Tyk2:Stat1,3,5

May, B., Touw, IP.

03/05/2024

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. ↗
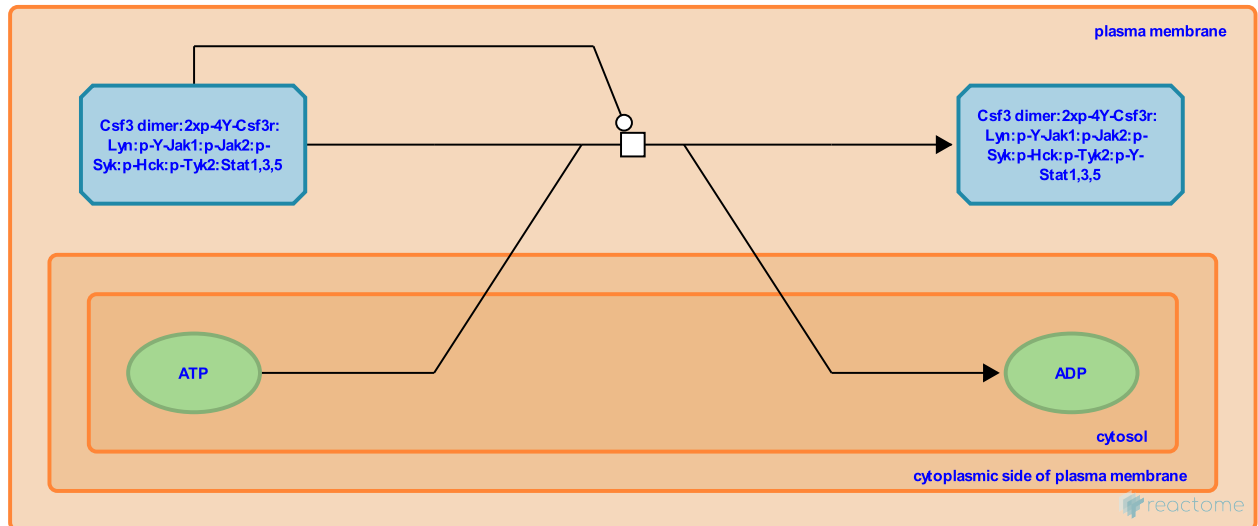
Reactome database release: 88

This document contains 1 reaction (see Table of Contents)

p-Y-Jak1,2 phosphorylates Stat1,3,5 in Csf3 dimer:2xp-4Y-Csf3r:Lyn:p-Y-Jak1:p-Jak2:p-Tyk2:Stat1,3,5 ↗

Stable identifier: R-MMU-9674908

Type: transition

Compartments: plasma membrane

Phosphorylated Jak1 (p-Y-Jak1) phosphorylates the Stat proteins Stat1 (de Koning et al. 1996, Nicholson et al. 1996, Shimoda et al. 1997), Stat3 (Nicholson et al. 1995, de Koning et al. 1996, Nicholson et al. 1996, Shimoda et al. 1997, Chakraborty et al. 1999, de Koning et al. 2000), and Stat5 (de Koning et al. 1996, Nicholson et al. 1996, Shimoda et al. 1997, Dong et al. 1998, Ward et al. 1999, Gits et al. 2006) at the cytosolic domain of Csf3r (G-CSFR). Phosphorylated Jak2 acts redundantly with p-Y-Jak1 to phosphorylate Stat proteins (Gits et al. 2006).

Literature references

Novak, U., Layton, JE., Nicholson, SE., Ziegler, SF. (1995). Distinct regions of the granulocyte colony-stimulating factor receptor are required for tyrosine phosphorylation of the signaling molecules JAK2, Stat3, and p42, p44MAPK. *Blood, 86*, 3698-704. ↗

Novak, U., Layton, JE., Nicholson, SE., Hilton, DJ., Starr, R. (1996). Tyrosine residues in the granulocyte colony-stimulating factor (G-CSF) receptor mediate G-CSF-induced differentiation of murine myeloid leukemic (M1) cells. *J. Biol. Chem., 271*, 26947-53. ↗

Nagata, S., Ihle, JN., Murakami, H., Stark, GR., Rogers, NC., Feng, J. et al. (1997). Jak1 plays an essential role for receptor phosphorylation and Stat activation in response to granulocyte colony-stimulating factor. *Blood, 90*, 597-604. ↗

Schelen, AM., Ward, AC., Touw, IP., Löwenberg, B., van Leeuwen, D., de Koning, JP. et al. (2000). STAT3-mediated differentiation and survival and of myeloid cells in response to granulocyte colony-stimulating factor: role for the cyclin-dependent kinase inhibitor p27(Kip1). *Oncogene, 19*, 3290-8. ↗

Touw, IP., Dong, F., de Koning, JP., Liu, X., Grimley, PM., Hennighausen, L. et al. (1998). Stimulation of Stat5 by granulocyte colony-stimulating factor (G-CSF) is modulated by two distinct cytoplasmic regions of the G-CSF receptor. *J Immunol, 161*, 6503-9. ↗

Editions

2020-01-27	Authored, Edited	May, B.
2020-12-12	Reviewed	Touw, IP.