

FKBP5 binds HSP90:ATP:STIP1:HSP70:nascent protein

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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

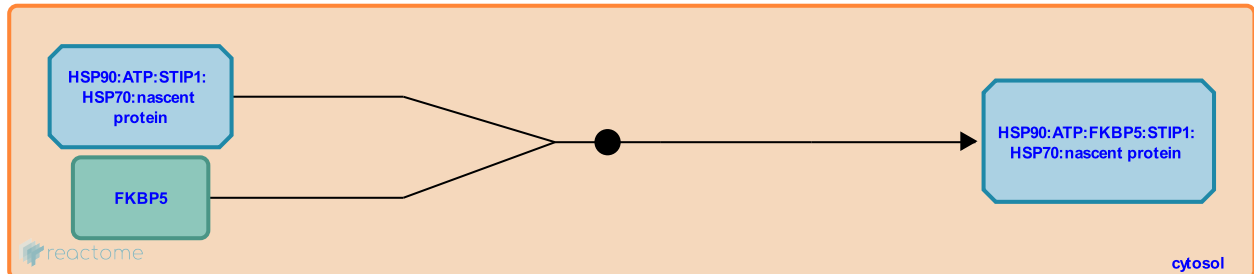
This document contains 1 reaction ([see Table of Contents](#))

FKBP5 binds HSP90:ATP:STIP1:HSP70:nascent protein ↗

Stable identifier: R-HSA-5618105

Type: binding

Compartments: cytosol



FK506 binding protein 5 (FKBP51, also known as FKBP5) is a member of the immunophilin (IMM) protein family of intracellular proteins. The signature domain of the IMM family is the peptidyl-prolyl-cis/trans-isomerase (PPIase) domain, which is in turn the drug binding domain. IMMs are classified by their ability to bind immunosuppressant drugs – CyPs (cyclophilins) bind cyclosporine A (CsA), and FKBP5s (FK506-binding proteins) bind FK506 (Pratt and Toft 1997; Kang et al. 2008). In addition to the PPIase domain, there are three additional domains – the nucleotide-binding domain, (also called FKBD2 in FKBP proteins) where ATP binds, the calmodulin-binding domain, a poorly characterized domain able to interact with calmodulin, and tetratricopeptide repeat (TPR) domains, sequences of 34 amino acids repeated in tandem through which FKBP5s bind to the HSP90 C-terminal sequence MEEVD (Davies et al. 2005; Wu et al. 2004). Mass spectrometry analysis showed that FKBP51 (FKBP5) and FKBP52 (FKBP4) form analogous complexes with GR:HSP90:STIP1:HSP70:ATP (Ebong IO et al. 2016). Binding of FKBP51 (FKBP5) and other immunophilins may weaken the association of TPR domain containing protein STIP1 with HSP90 complex (Li et al. 2011).

Literature references

Galigniana, MD., Harris, DC., Lagadari, M., Erlejman, AG., Cox, MB. (2014). Molecular chaperone activity and biological regulatory actions of the TPR-domain immunophilins FKBP51 and FKBP52. *Curr. Protein Pept. Sci.*, 15, 205-15. ↗

Editions

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