

# CBY1 binds beta-catenin

Gillespie, ME., Kikuchi, A., Rajakulendran, N., Rothfels, K., van Amerongen, R.

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

The contents of this document may be freely copied and distributed in any media, provided the authors, plus the institutions, are credited, as stated under the terms of [Creative Commons Attribution 4.0 International \(CC BY 4.0\) License](#). For more information see our [license](#).

## 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: 75

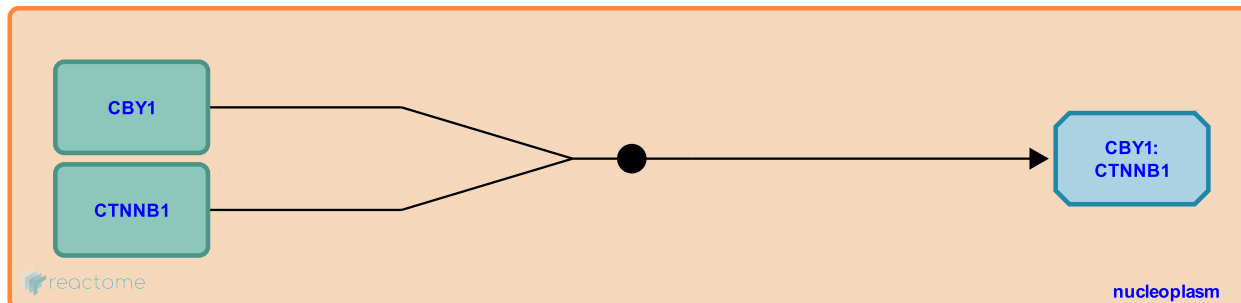
This document contains 1 reaction ([see Table of Contents](#))

## CBY1 binds beta-catenin [↗](#)

**Stable identifier:** R-HSA-3769383

**Type:** binding

**Compartments:** nucleoplasm



Chibby (CBY1) is a conserved 126 amino acid protein that acts as an antagonist to the canonical WNT signaling pathway. CBY1 binds to the C-terminal region of beta-catenin and inhibits beta-catenin-dependent signaling by competing for the TCF/LEF binding sites and by promoting beta-catenin nuclear export (Takemaru et al, 2003; Li et al, 2008; Li et al, 2010). Endogenous CBY1 and beta-catenin co-immunoprecipitate from HEK293 cells and overexpression of CBY1 reduces expression of a beta-catenin dependent reporter gene, supporting a functional role for the CBY1-beta-catenin interaction in vivo (Takemaru et al, 2003). Studies with CBY1 knockout mice show only a slight effect on expression of WNT-dependent target genes, however; more work will be required to fully elucidate the role of CBY1 in regulating endogenous WNT signaling (Veronina et al, 2009).

### Literature references

- Li, FQ., Mofunanya, A., Harris, K., Takemaru, K. (2008). Chibby cooperates with 14-3-3 to regulate beta-catenin subcellular distribution and signaling activity. *J. Cell Biol.*, 181, 1141-54. [↗](#)
- Li, FQ., Mofunanya, A., Fischer, V., Hall, J., Takemaru, K. (2010). Nuclear-cytoplasmic shuttling of Chibby controls beta-catenin signaling. *Mol. Biol. Cell*, 21, 311-22. [↗](#)
- Voronina, VA., Takemaru, K., Treuting, P., Love, D., Grubb, BR., Hajjar, AM. et al. (2009). Inactivation of Chibby affects function of motile airway cilia. *J. Cell Biol.*, 185, 225-33. [↗](#)
- Takemaru, K., Yamaguchi, S., Lee, YS., Zhang, Y., Carthew, RW., Moon, RT. (2003). Chibby, a nuclear beta-catenin-associated antagonist of the Wnt/Wingless pathway. *Nature*, 422, 905-9. [↗](#)

### Editions

2013-05-30	Authored	Rothfels, K.
2013-10-03	Edited	Gillespie, ME.
2014-01-22	Reviewed	Rajakulendran, N.
2014-02-15	Reviewed	van Amerongen, R.
2014-04-22	Reviewed	Kikuchi, A.