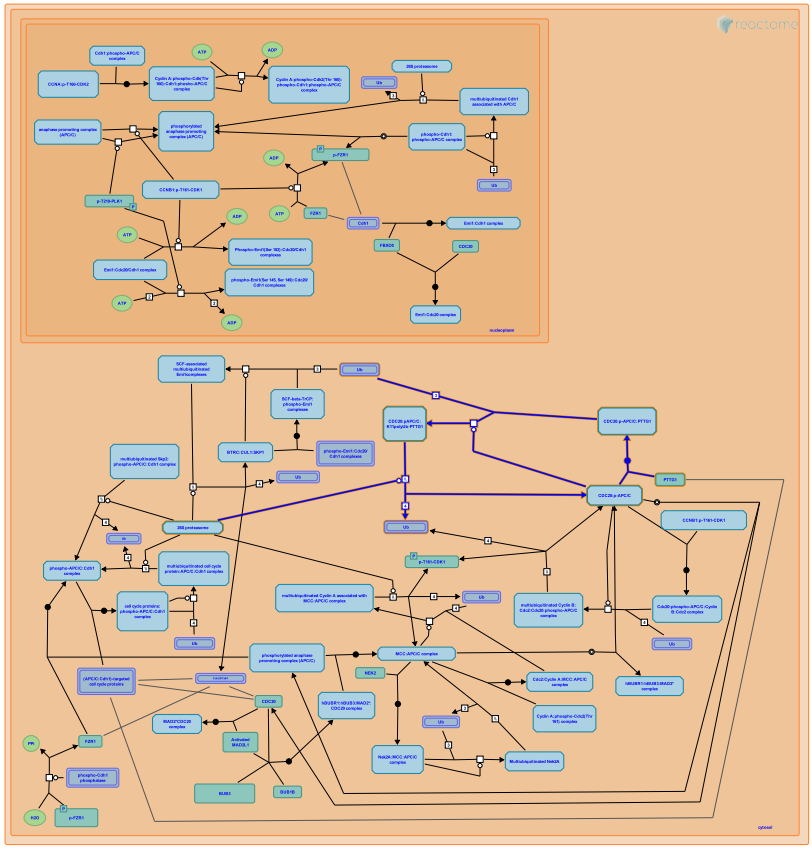
APC/C:Cdc20 mediated degradation of Securin



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13/11/2019

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. ↗

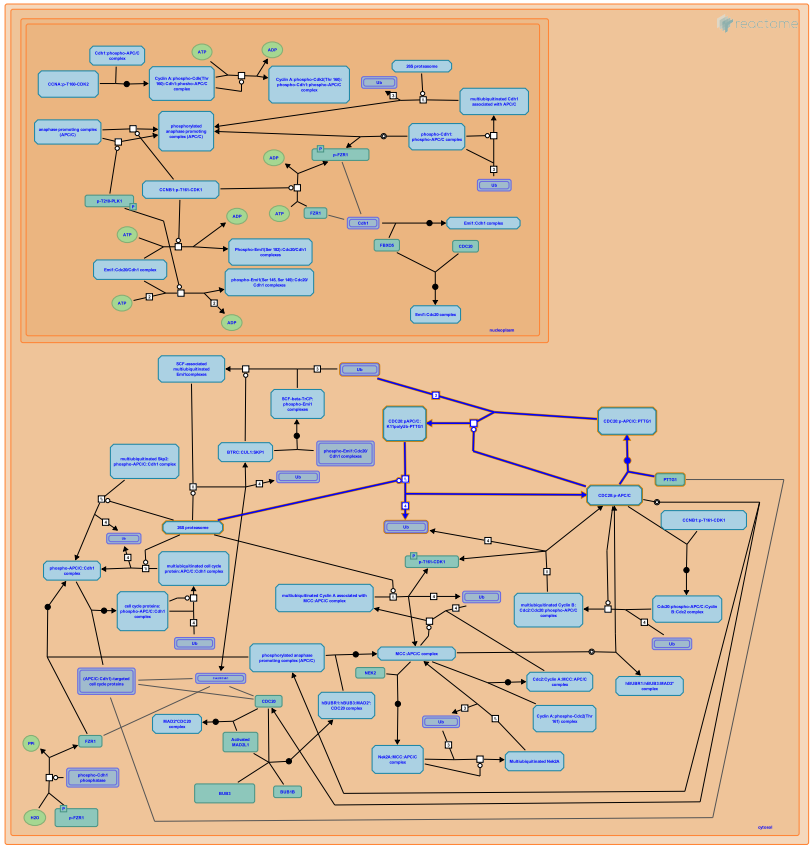
Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res, 46*, D649-D655. ↗

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. ↗

APC/C:Cdc20 mediated degradation of Securin ↗

Stable identifier: R-HSA-174154

Compartments: cytosol



The separation of sister chromatids in anaphase requires the destruction of the anaphase inhibitor, securin. Securin associates with and inactivates the protease, separase. Separase cleaves the cohesin subunit, Scc1 that is responsible for the cohesion of sister chromatids (reviewed in Nasmyth et al., 2000). Securin destruction begins at metaphase after the mitotic spindle checkpoint has been satisfied (Hagting et al., 2002).

Literature references

Nasmyth, K., Peters, JM., Uhlmann, F. (2000). Splitting the chromosome: cutting the ties that bind sister chromatids. *Science, 288*, 1379-85. ↗

Hagting, A., Den Elzen, N., Vodermaier, HC., Waizenegger, IC., Peters, JM., Pines, J. (2002). Human securin proteolysis is controlled by the spindle checkpoint and reveals when the APC/C switches from activation by Cdc20 to Cdh1. *J Cell Biol, 157*, 1125-37. ↗

Editions

2006-01-26	Authored	Lorca, T., Castro, A.
2006-01-30	Edited	Matthews, L.
2006-03-27	Reviewed	Peters, JM.

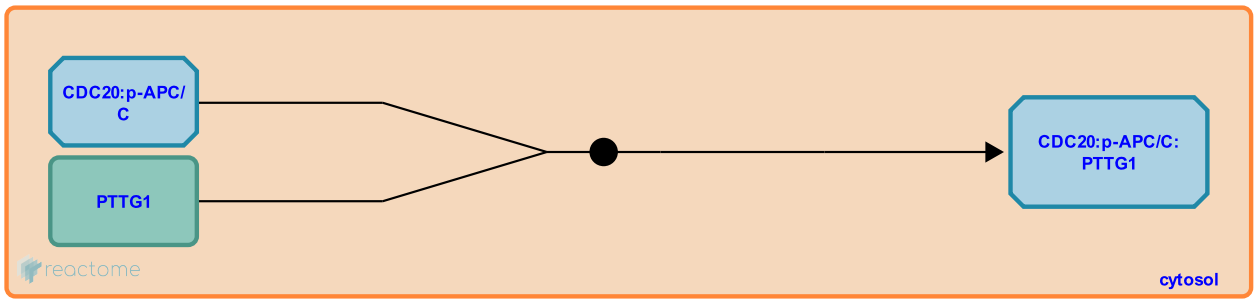
Association of Securin with Cdc20:APC/C complex ↗

Location: APC/C:Cdc20 mediated degradation of Securin

Stable identifier: R-HSA-174121

Type: binding

Compartments: cytosol



Securin is thought to be recognized by the APC/C:Cdc20 complex through its conserved D-box sequence.

Followed by: Ubiquitination of Securin by phospho-APC/C:Cdc20 complex

Literature references

Hagting, A., Den Elzen, N., Vodermaier, HC., Waizenegger, IC., Peters, JM., Pines, J. (2002). Human securin proteolysis is controlled by the spindle checkpoint and reveals when the APC/C switches from activation by Cdc20 to Cdh1. *J Cell Biol, 157*, 1125-37. ↗

Editions

2006-01-26	Authored	Lorca, T., Castro, A.
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2006-03-27	Reviewed	Peters, JM.

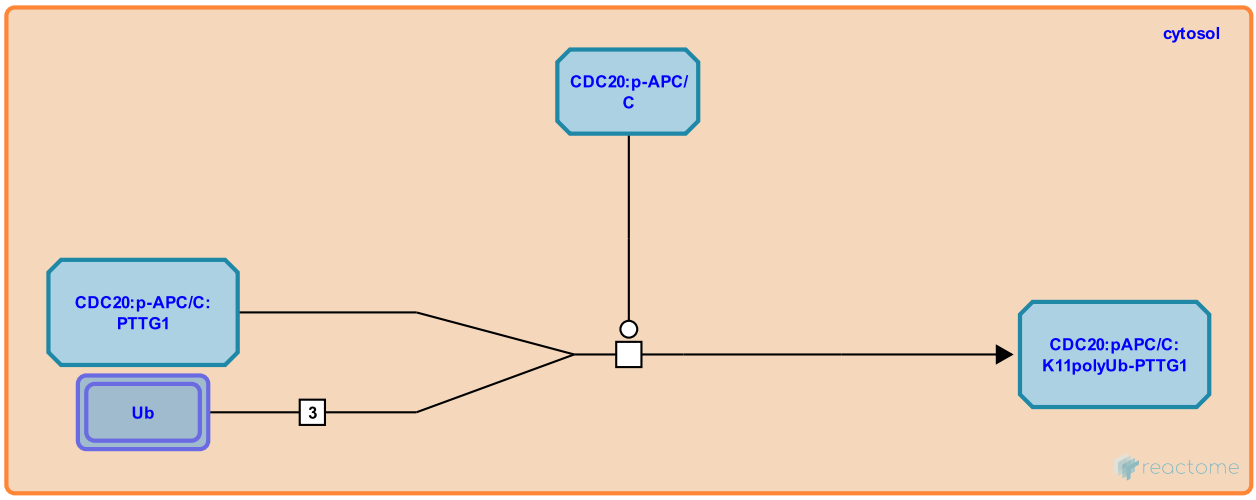
Ubiquitination of Securin by phospho-APC/C:Cdc20 complex ↗

Location: APC/C:Cdc20 mediated degradation of Securin

Stable identifier: R-HSA-174144

Type: transition

Compartments: cytosol



Securin is ubiquitinated by APC/C:Cdc20 (Hagting et al., 2002; Jin et al. 2008).

Preceded by: Association of Securin with Cdc20:APC/C complex

Followed by: Degradation of multiubiquitinated Securin

Literature references

Hagting, A., Den Elzen, N., Vodermaier, HC., Waizenegger, IC., Peters, JM., Pines, J. (2002). Human securin proteolysis is controlled by the spindle checkpoint and reveals when the APC/C switches from activation by Cdc20 to Cdh1. *J Cell Biol, 157*, 1125-37. ↗

Jin, L., Williamson, A., Banerjee, S., Philipp, I., Rape, M. (2008). Mechanism of ubiquitin-chain formation by the human anaphase-promoting complex. *Cell, 133*, 653-65. ↗

Editions

2006-01-26	Authored	Lorca, T., Castro, A.
2006-01-30	Edited	Matthews, L.
2006-03-27	Reviewed	Peters, JM.

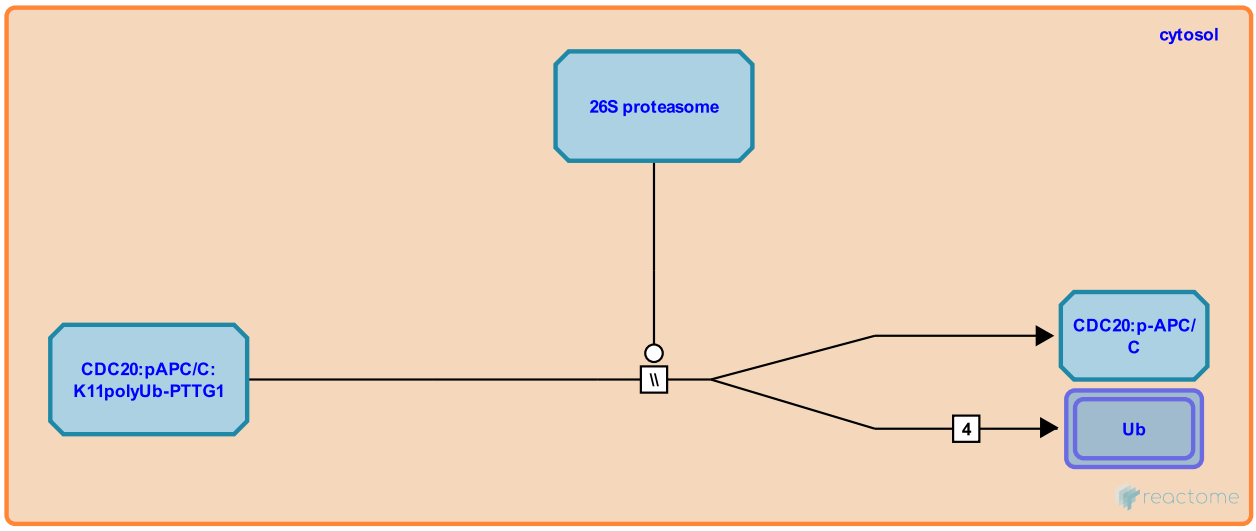
Degradation of multiubiquitinated Securin ↗

Location: APC/C:Cdc20 mediated degradation of Securin

Stable identifier: R-HSA-174202

Type: omitted

Compartments: cytosol



Following ubiquitination, securin is degraded by the 26S proteasome.

Preceded by: Ubiquitination of Securin by phospho-APC/C:Cdc20 complex

Literature references

Hagting, A., Den Elzen, N., Vodermaier, HC., Waizenegger, IC., Peters, JM., Pines, J. (2002). Human securin proteolysis is controlled by the spindle checkpoint and reveals when the APC/C switches from activation by Cdc20 to Cdh1. *J Cell Biol, 157*, 1125-37. ↗

Editions

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Table of Contents