

SCF-beta-TrCP mediated degradation of

Emi1



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This is just an excerpt of a full-length report for this pathway. To access the complete report, please download it at the <u>Reactome Textbook</u>.

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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

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- Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics*, 33, 3461-3467. A
- 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. *オ*

This document contains 1 pathway and 3 reactions (see Table of Contents)

SCF-beta-TrCP mediated degradation of Emi1 7

Stable identifier: R-HSA-174113

Compartments: cytosol



Emil destruction in early mitosis requires the SCF beta-TrCP ubiquitin ligase complex. Binding of beta-TrCP to Emil occurs in late prophase and requires phosphorylation at the DSGxxS consensus motif as well as Cdk mediated phosphorylation. A two-step mechanism has been proposed in which the phosphorylation of Emil by Cdc2 occurs after the G2-M transition followed soon after by binding of beta-TrCP to the DSGxxS phosphorylation sites. Emil is then poly-ubiquitinated and degraded by the 26S proteasome.

Literature references

Reimann, JD., Loktev, A., Hsu, JY., Jackson, PK., Margottin-Goguet, F., Hsieh, HM. (2003). Prophase destruction of Emi1 by the SCF(betaTrCP/Slimb) ubiquitin ligase activates the anaphase promoting complex to allow progression beyond prometaphase. *Dev Cell, 4*, 813-26. *¬*

2006-01-26	Authored	Lorca, T., Castro, A.
2006-01-30	Edited	Matthews, L.
2006-03-28	Reviewed	Peters, JM.

Phosphorylated Emi1 binds the beta-TrCP in the SCF complex 7

Location: SCF-beta-TrCP mediated degradation of Emil

Stable identifier: R-HSA-174209

Type: binding

Compartments: cytosol



Cdk mediated phosphorylation of Emi1 is believed to promotes its phospho- Ser145-Ser149 dependent association with beta-TrCP.

Followed by: Ubiquitination of Emi1 by SCF-beta-TrCP

Literature references

- Reimann, JD., Loktev, A., Hsu, JY., Jackson, PK., Margottin-Goguet, F., Hsieh, HM. (2003). Prophase destruction of Emil by the SCF(betaTrCP/Slimb) ubiquitin ligase activates the anaphase promoting complex to allow progression beyond prometaphase. *Dev Cell, 4*, 813-26. *¬*
- Chiaur, DS., Latres, E., Pagano, M. (1999). The human F box protein beta-Trcp associates with the Cul1/Skp1 complex and regulates the stability of beta-catenin. *Oncogene, 18,* 849-54. *¬*

2006-01-26	Authored	Lorca, T., Castro, A.
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Ubiquitination of Emi1 by SCF-beta-TrCP 7

Location: SCF-beta-TrCP mediated degradation of Emi1

Stable identifier: R-HSA-174159

Type: transition

Compartments: cytosol



Following its association with SCF-BTrCP, phospho-Emi1 is poly-ubiquitinated.

Preceded by: Phosphorylated Emi1 binds the beta-TrCP in the SCF complex

Followed by: SCF-mediated degradation of Emi1

Literature references

Hansen, DV., Loktev, AV., Ban, KH. (2004). Plk1 regulates activation of the anaphase promoting complex by phosphorylating and triggering SCFbetaTrCP-dependent destruction of the APC Inhibitor Emi1. *Mol Biol Cell, 15*, 5623-34. *¬*

2006-01-26	Authored	Lorca, T., Castro, A.
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SCF-mediated degradation of Emi1 7

Location: SCF-beta-TrCP mediated degradation of Emi1

Stable identifier: R-HSA-174203

Type: omitted

Compartments: cytosol



Multiubiquitinated Emi1 is degraded by the 26S proteasome.

Preceded by: Ubiquitination of Emi1 by SCF-beta-TrCP

Literature references

Hansen, DV., Loktev, AV., Ban, KH. (2004). Plk1 regulates activation of the anaphase promoting complex by phosphorylating and triggering SCFbetaTrCP-dependent destruction of the APC Inhibitor Emi1. *Mol Biol Cell, 15*, 5623-34. *⊲*

2006-01-26	Authored	Lorca, T., Castro, A.
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