Activation of APC/C and APC/C:Cdc20 mediated degradation of mitotic proteins

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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.

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


Reactome database release: 71

This document contains 3 pathways (see Table of Contents)

https://www.reactome.org
Activation of APC/C and APC/C:Cdc20 mediated degradation of mitotic proteins

Stable identifier: R-HSA-176814

APC/C:Cdc20 is first activated at the prometaphase/metaphase transition through phosphorylation of core subunits of the APC/C by mitotic kinases as well as recruitment of the APC/C activator protein Cdc20. APC/C:Cdc20 promotes the multiubiquitination and ordered degradation of Cyclin A and Nek2 degradation in prometaphase followed by Cyclin B and securin in metaphase (Reviewed in Castro et al., 2005).

Literature references


Editions

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Phosphorylation of the APC/C

**Location:** Activation of APC/C and APC/C:Cdc20 mediated degradation of mitotic proteins

**Stable identifier:** R-HSA-176412

**Compartments:** nucleoplasm

Phosphorylation of APC subunits is required for Cdc20 mediated activation by of the APC/C at the metaphase anaphase transition (Kramer et al., 2000). While the kinases responsible for phosphorylation in vivo have not been determined with certainty, both Plk1 and Cyclin B:Cdc2 have been implicated in this process.

**Literature references**


**Editions**

2006-03-28

Reviewed

Peters, JM.
Following phosphorylation of the APC/C core subunits by mitotic kinases, the activating protein, Cdc20 is recruited to the APC and promotes the multiubiquitination and subsequent degradation of the mitotic cyclins (Cyclin A and Cyclin B) as well as the protein securin which functions in sister chromatid cohesion. Timely degradation of these proteins is essential for sister chromatid separation and the proper timing of exit from mitosis (See Zachariae and Nasmyth, 1999). Cdc20 is degraded late in mitosis (Reviewed in Owens and Hoyt, 2005)

**Literature references**


**Editions**

2006-03-28 Reviewed Peters, JM.
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