PTK6 Regulates Cell Cycle

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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 Reactome Textbook.

08/11/2022
**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: 82

This document contains 1 pathway and 2 reactions (see Table of Contents)

https://reactome.org
PTK6 promotes cell cycle progression by phosphorylating and inactivating CDK inhibitor CDKN1B (p27) (Patel et al. 2015). PTK6 also negatively modulates CDKN1B expression via regulation of the activity of the FOXO3 (FOXO3A) transcription factor (Chan and Nimnual 2010).

**Literature references**


**Editions**

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Activated PTK6 binds CDKN1B

**Location:** PTK6 Regulates Cell Cycle

**Stable identifier:** R-HSA-8848414

**Type:** binding

**Compartments:** cytosol

Activated PTK6 (BRK) binds to CDKN1B (p27KIP1) that is in a complex with CDK4 and cyclin D1 (CCND1). Since PTK6 increases cyclin E1 (CCNE1) levels downstream of ERBB2 while decreasing CDKN1B levels, PTK6 probably also associates with CDKN1B bound to the complex of CCNE1 and CDK2 (Xiang et al. 2008).

**Followed by:** PTK6 phosphorylates CDKN1B

**Literature references**


**Editions**

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PTK6 phosphorylates CDKN1B

Location: PTK6 Regulates Cell Cycle

Stable identifier: R-HSA-8848436

Type: transition

Compartments: cytosol

PTK6 (BRK) phosphorylates CDKN1B (p27KIP1) bound to the complex of CDK4 and CCND1 (cyclin D1) on tyrosine residue Y88 and possibly other tyrosines (e.g. Y89) (Patel et al. 2015). Based on the finding that PTK6 promotes ERBB2-induced increase in cyclin E1 (CCNE1) levels and decrease in CDKN1B levels (Xiang et al. 2008), and supported by the analogy with other SRC family kinases that phosphorylate CDKN1B (Grimmler et al. 2007), PTK6 is likely to also phosphorylate CDKN1B bound to the complex of CCNE1 and CDK2. Phosphorylation of CDKN1B (p27KIP1) on tyrosine residue Y88 by SRC family kinases dislodges the 3-10 helix of CDKN1B from the active site of CDK2 or CDK4, thus converting CDKN1B from a bound inhibitor to a bound non-inhibitor (Grimmler et al. 2007, Ray et al. 2009).

Preceded by: Activated PTK6 binds CDKN1B

Literature references

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