CSNK1E,CSNK1D phosphorylate CRY and PER 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.

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Literature references

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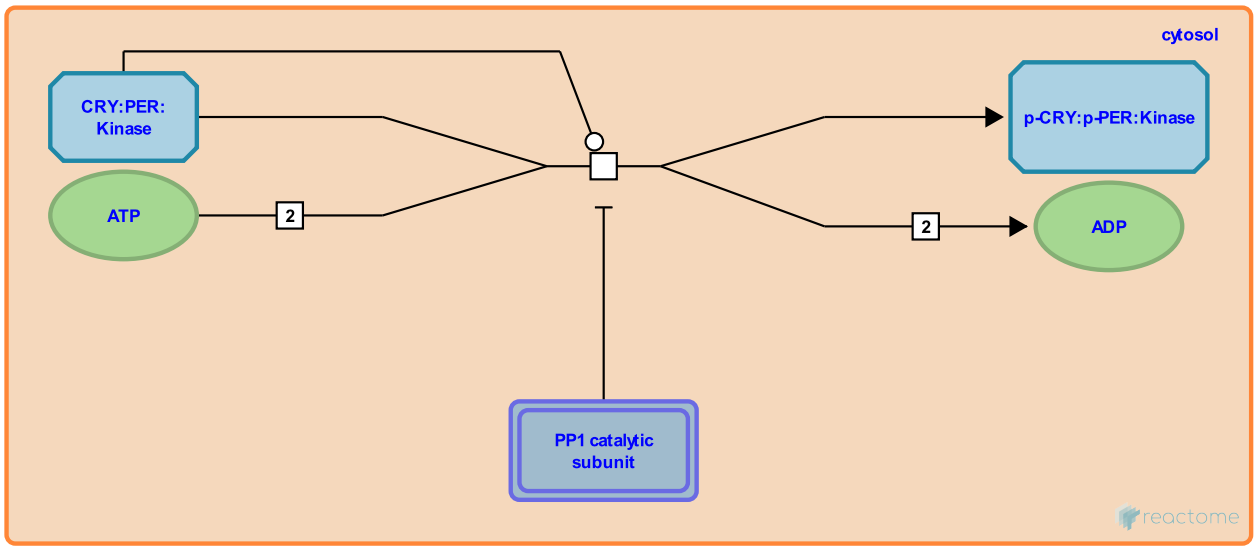
Stable identifier: R-HSA-400382

Type: transition

Compartments: cytosol

Inferred from: Csnk1e,Csnk1d phosphorylate Cry and Per proteins (Mus musculus)



In the cytosol the kinases CSNK1D (casein kinase I delta) and CSNK1E (casein kinase I epsilon) phosphorylate PER1, PER2, CRY1, and CRY2 at multiple sites. Evidence indicates that PER:CRY complexes form a stable ternary complex with either CSNK1E or CSNK1D. Both kinases are able to bind and phosphorylate PER proteins. CSNK1E has been shown to phosphorylate CRY proteins only when they are complexed with PER proteins.

PER proteins contain a nuclear localization sequence and a nuclear export sequence allowing their movement into and out of the nucleus. Phosphorylation is required for transit of PER:CRY:kinase complexes into the nucleus and for interaction of PER proteins with the ubiquitin-mediated degradation process in the cytoplasm.

A mutation at Serine662 of PER2 is responsible for familial advanced phase sleep syndrome, however the particular kinase responsible for phosphorylating Serine662 is unknown.

Literature references

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Editions

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