DMPK phosphorylates PLN

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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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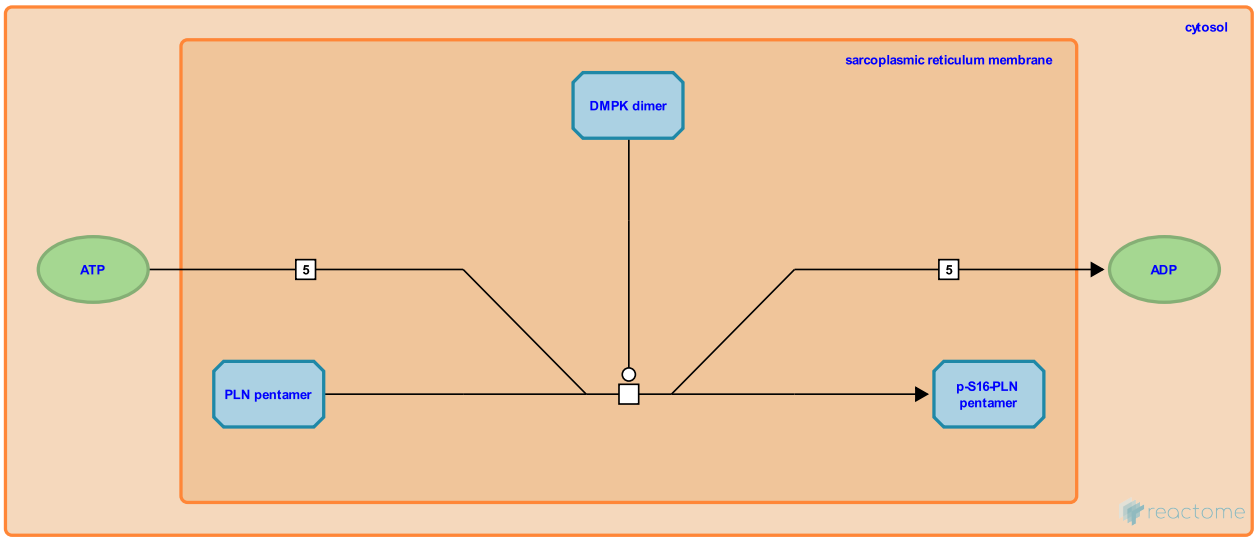
Stable identifier: R-HSA-5578777

Type: transition

Compartments: cytosol, sarcoplasmic reticulum membrane



Force generation of the heart and calcium homeostasis are coupled in the myocardium. In the sarcoplasmic reticulum (SR), calcium stores provide the majority of calcium used in muscle contraction-relaxation. During relaxation, an ATP-dependent calcium pump (ATP2A2 aka SERCA) in the SR is essential for the recovery of calcium. The reuptake of calcium by ATP2A2 determines the rate of relaxation and the size of the calcium store available for subsequent contractions. In cardiac muscle, a second protein called phospholamban (PLN) acts as a reversible inhibitor of ATP2A2 and thereby modulates contractility in response to physiological factors. Defects in PLN are associated with lethal dilated cardiomyopathy in humans (Ceholski et al. 2012). PLN is a pentameric protein that, when phosphorylated, alleviates ATP2A2 inhibition and may stimulate SR calcium uptake in cardiomyocytes (Kaliman et al. 2005). Phosphorylation of PLN is mediated by myotonin-protein kinase (DMPK), a SR-bound homodimeric enzyme (Bush et al. 2000, Zhang & Epstein 2003).

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Editions

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