(d)NTP + ADP <=> (d)NDP + ATP

(NME1,2,3)

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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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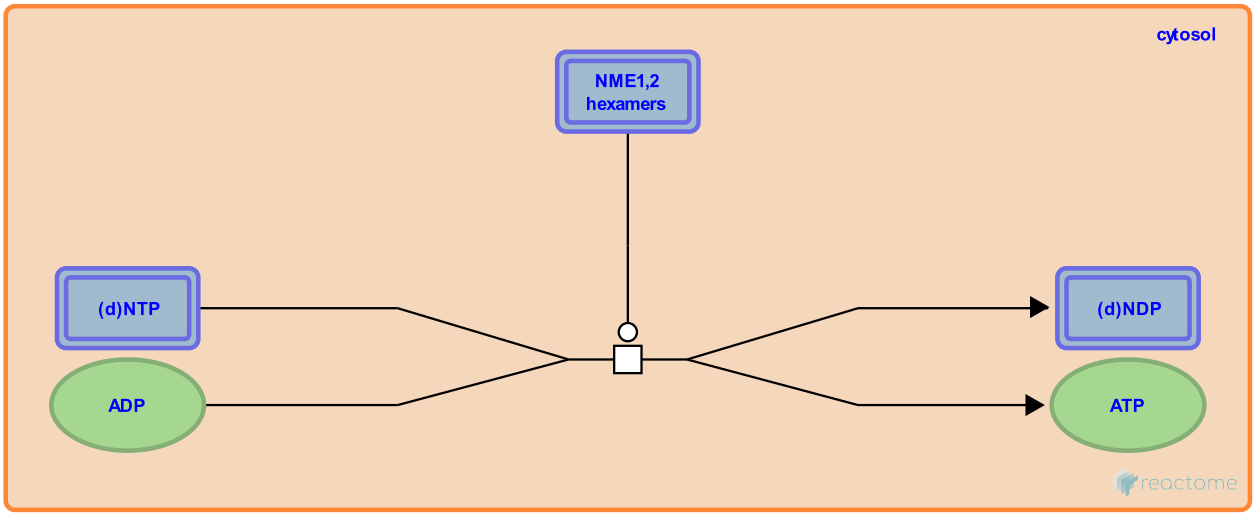
Stable identifier: R-HSA-482621

Type: transition

Compartments: cytosol



Cytosolic nucleoside diphosphate kinases catalyze the reversible reaction of ribonucleoside and deoxyribonucleoside 5'-diphosphates with ADP to form the corresponding nucleoside 5'-diphosphates and ATP. These kinases are ubiquitously expressed enzymes with broad substrate specificities (Berg and Joklik 1954; Parks and Agarwal 1973). Three human cytosolic nucleoside diphosphate kinase proteins, NME1, 2, and 3, have been characterized biochemically (Gilles et al. 1991; Schaertl et al. 1998; Erent et al. 2001; Chen et al. 2003). All are catalytically active as hexamers: homohexamers of NME1, 2, and 3 have been described, as have heterohexamers containing all possible combinations of NME1 and 2 (Gilles et al. 1991; Erent et al. 2001).

While the high ratio of ATP to ADP concentrations in the cytosol normally favors the conversion of (d)NDP and ATP to (d)NTP and ADP, the reversibility of the reactions and the overlapping substrate specificities of the enzymes suggest that this group of reverse reactions can buffer the intracellular nucleotide pool and regulate the relative concentrations of individual nucleoside di- and tri-phosphates in the pool.

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Editions

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