HK1,2,3,GCK phosphorylate Glc to form G6P

D'Eustachio, P.

European Bioinformatics Institute, New York University Langone Medical Center, Ontario Institute for Cancer Research, Oregon Health and Science University.

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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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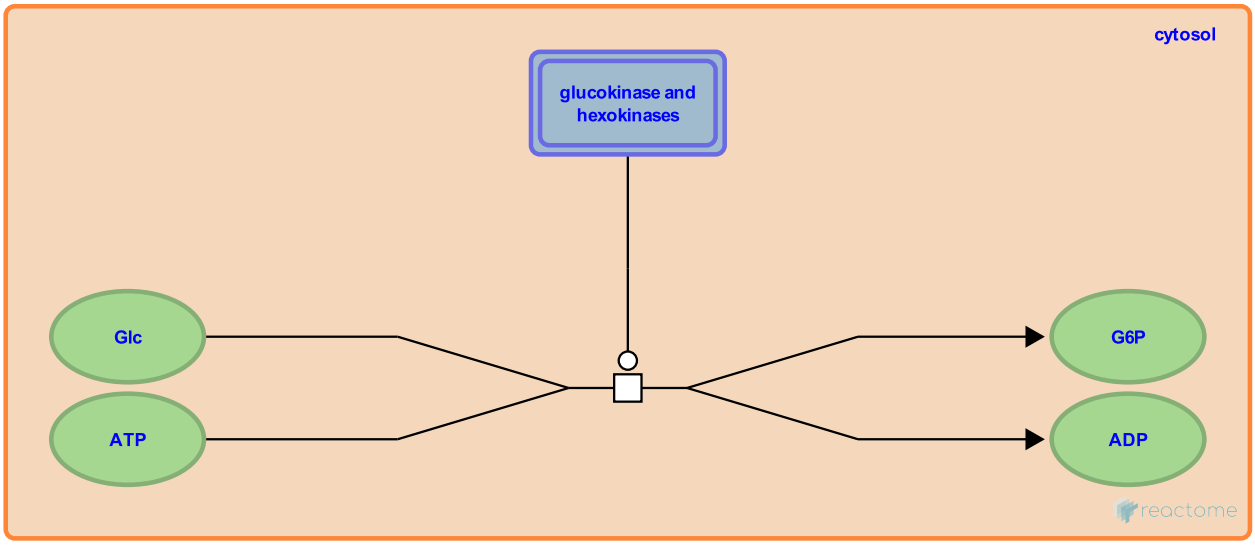
Stable identifier: R-HSA-70420

Type: transition

Compartments: cytosol



Cytosolic glucokinase and the three isoforms of hexokinase catalyze the irreversible reaction of glucose and ATP to form glucose 6 phosphate and ADP. In the body glucokinase is found only in hepatocytes and pancreatic beta cells. Glucokinase and the hexokinase enzymes differ in that glucokinase has a higher Km than the hexokinases and is less readily inhibited by the reaction product. As a result, glucokinase should be inactive in the fasting state when glucose concentrations are low but in the fed state should have an activity proportional to glucose concentration. These features are thought to enable efficient glucose uptake and retention in the liver, and to function as a sensor of glucose concentration coupled to insulin release in pancreatic beta cells (Thorens 2001). Glucokinase mutations are associated with MODY2, a heritable early onset form of type II diabetes (Tanizawa et al. 1991; Takeda et al. 1993). Three human hexokinase enzymes have been characterized, HK1 (Aleshin et al. 1998), HK2 (Lehto et al. 1995), and HK3 (Rijksen at al. 1982).

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Editions

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