Carbonic anhydrase hydrates carbon dioxide (mitochondria)

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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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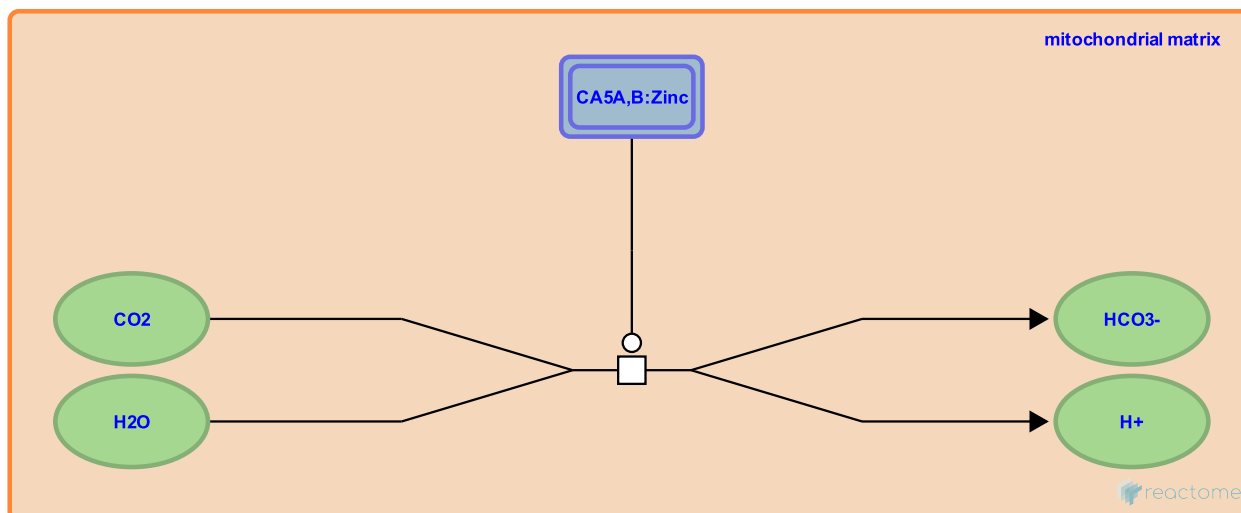
Reactome database release: 74

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Carbonic anhydrase hydrates carbon dioxide (mitochondria) ↗

Stable identifier: R-HSA-1475032

Type: transition

Compartments: mitochondrial matrix

Carbonic anhydrase VA (CA5A, Nagao et al. 1993, Franchi et al. 2003, Nishimori et al. 2007) and carbonic anhydrase VB (CA5B, Fujikawa-Adachi et al. 1999, Nishimori et al. 2005, Nishimori et al. 2007) hydrate carbon dioxide in mitochondria to yield bicarbonate and a proton. Carbonic anhydrase deprotonates water to yield a zinc-hydroxyl group and a proton which is transferred to external buffer molecules via histidine or glutamate residues in carbonic anhydrase. The hydroxyl group reacts with carbon dioxide in the active site to yield bicarbonate. A water molecule displaces the bicarbonate and the reaction cycle begins again (reviewed in Lindskog 1997). Depending on the concentrations of reactants the reaction is reversible.

Literature references

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Editions

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