Formation of 4Fe-4S cluster on ISCA1:ISCA2

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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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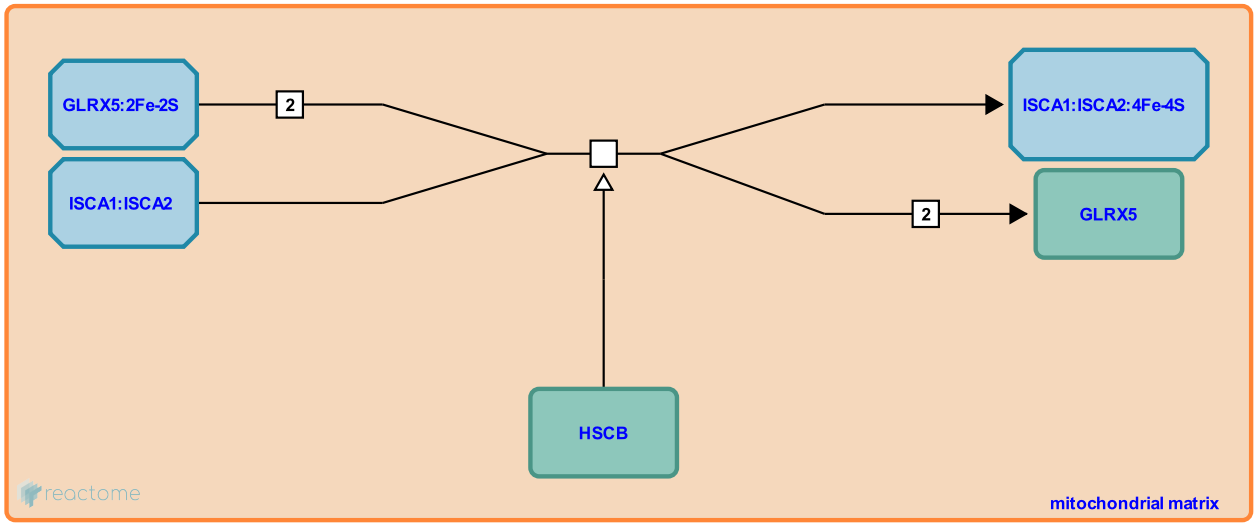
Stable identifier: R-HSA-8878815

Type: transition

Compartments: mitochondrial matrix



Iron-sulfur clusters containing 4Fe-4S are assembled from 2Fe-2S clusters on ISCA1:ISCA2 heterodimers (Banci et al. 2014, Brancaccio et al. 2014, inferred from Saccharomyces cerevisiae in Mühlenhoff et al. 2011). GLRX5:2Fe-2S can donate 2Fe-2S clusters to ISCA1:ISCA2 in vitro (Banci et al. 2014, Brancaccio et al. 2014). It is unclear if other proteins also donate 2Fe-2S clusters. Two conserved C-terminal cysteines of ISCA1:ISCA2 heterodimers extract [2Fe-2S] clusters from GLRX5, forming a ISCA1:ISCA2:GLRX5 intermediate containing two 2Fe-2S clusters (Brancaccio et al. 2017). The physiological electron donor required to convert the two 2Fe-2S clusters bound to the intermediate into a 4Fe-4S cluster is not yet characterized. ISCA1, ISCA2, and IBA57 are required for formation of holoenzymes such as aconitase that contain 4Fe-4S clusters (Sheftel et al. 2012). HSCB (HSC20), the homolog of yeast JAC1, interacts with HSPA9 and appears to facilitate the reaction (Uhrigshardt et al. 2010).

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Editions

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