

SLC8A1,2,3 exchange 3Na⁺ for Ca²⁺

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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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Reactome database release: 74

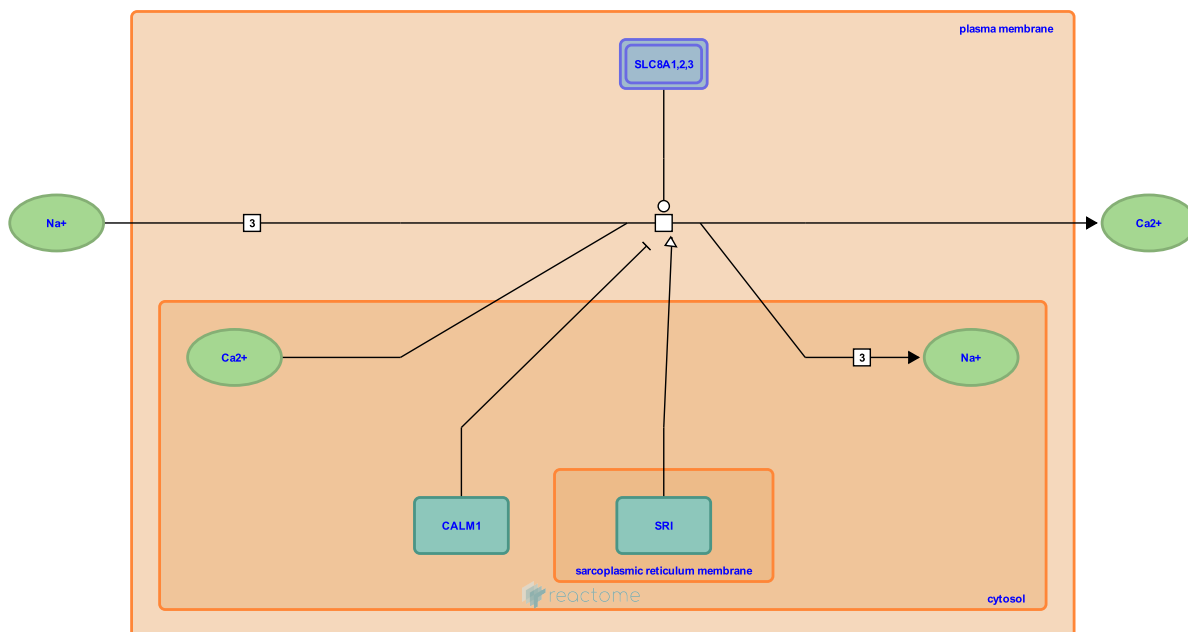
This document contains 1 reaction ([see Table of Contents](#))

SLC8A1,2,3 exchange 3Na⁺ for Ca²⁺ ↗

Stable identifier: R-HSA-425661

Type: transition

Compartments: plasma membrane, cytosol, extracellular region



The sodium/calcium exchangers 1, 2 and 3 (SLC8A1,2,3 aka NCX1,2,3) belong to one of three families that control Ca²⁺ flux across the plasma membrane or intracellular compartments. They extrude Ca²⁺ from the cell, using the electrochemical gradient of Na⁺ as it flows into the cell. One Ca²⁺ is exchanged for three Na⁺. During this electrogenic exchange, the membrane potential is altered. SLC8A1, 2, 3 play a minor role during phase 2, since they begin to restore ion concentrations. The high concentration of intracellular calcium starts contraction of those cells, which is sustained in the plateau phase. SLC8A1 has a ubiquitous expression profile (highest expression in heart, brain and kidney) and was originally cloned and characterized from human cardiac muscle (Komuro et al. 1992). Both SLC8A2 (Li et al. 1994) and SLC8A3 (Gabellini et al. 2002) are expressed in the brain.

In Rabbits, sorcin (SRI) activates SLC8A1, via the interaction of the respective Ca²⁺-binding domains (Zamparelli et al. 2010). Calmodulin (CALM1) binds to the cytoplasmic loop of NCX1 to negatively regulate exchange activity (Chou et al. 2015).

Literature references

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Editions

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