

SLC12A4,5,6,7 cotransport K⁺, Cl⁻ from cytosol to extracellular region

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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: 75

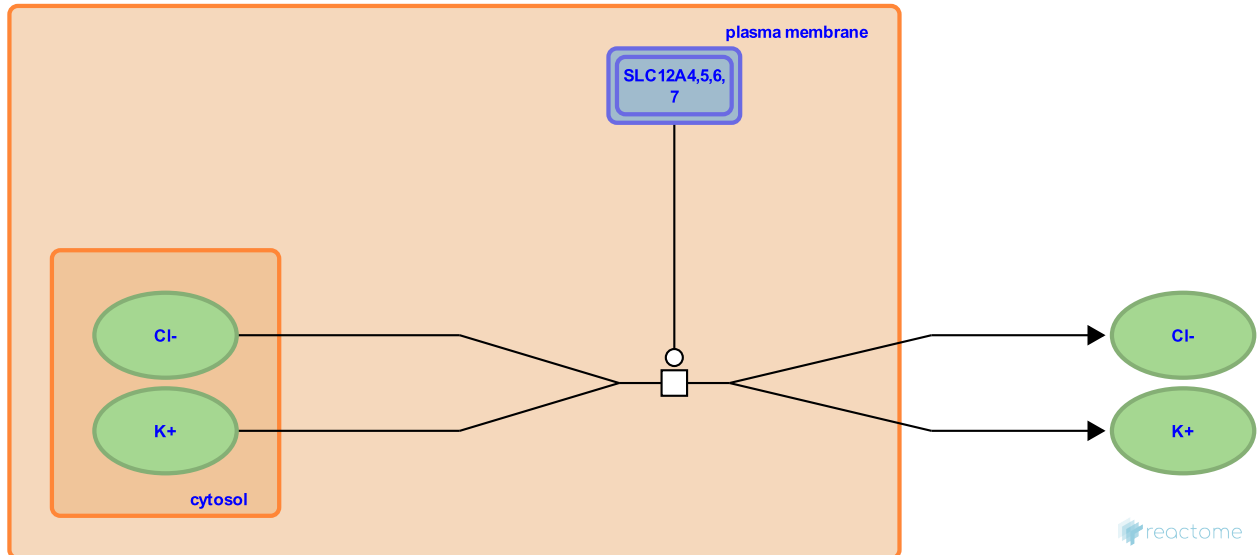
This document contains 1 reaction ([see Table of Contents](#))

SLC12A4,5,6,7 cotransport K⁺, Cl⁻ from cytosol to extracellular region ↗

Stable identifier: R-HSA-426155

Type: transition

Compartments: plasma membrane



K⁺/Cl⁻ cotransport is implicated not only in regulatory volume decrease, but also in transepithelial salt absorption, renal K⁺ secretion, myocardial K⁺ loss during ischemia and regulation of neuronal Cl⁻ concentration. Four genes (SLC12A4-7) encode the K⁺/Cl⁻ cotransporters KCC1-4 respectively. Cotransport of K⁺ and Cl⁻ is electroneutral with a 1:1 stoichiometry. These cotransporters function as homomultimers or heteromultimers with other K⁺/Cl⁻ cotransporters.

SLC12A4 encodes KCC1 (Gillen CM et al, 1996). KCC1 is ubiquitously expressed, suggesting a housekeeping role in the regulation of cell volume. SLC12A5 encodes KCC2 (Song L et al, 2002). KCC2's expression is restricted to neurons in the CNS and retina. It is thought KCC2 is important for Cl⁻ homeostasis in neurons. SLC12A6 encodes KCC3 (Race JE et al, 1999; Mount DB et al, 1999). KCC3 is highly expressed in heart, brain, spinal cord, kidney, muscle, pancreas and placenta. Defects in SLC12A6 are a cause of agenesis of the corpus callosum with peripheral neuropathy (ACCPN) (Howard HC et al, 2002). SLC12A7 encodes KCC4 (Mount DB et al, 1999) which is widely expressed, especially in the kidney. It is thought to play a role in transepithelial transport of Cl⁻ by the proximal tubule.

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Editions

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