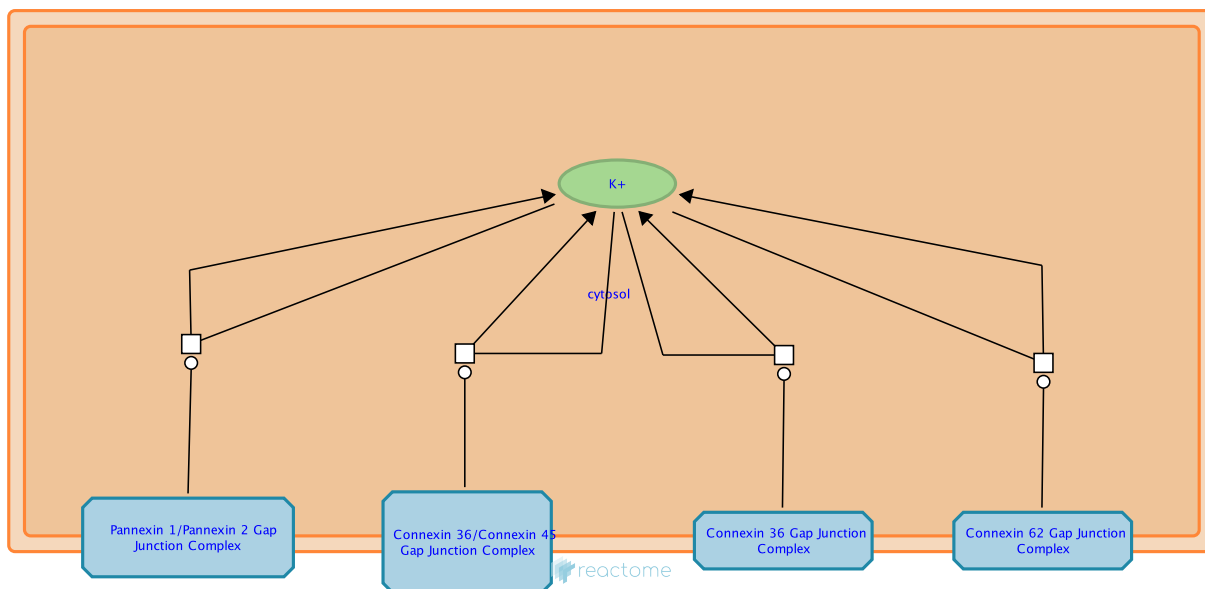


Transmission across Electrical Synapses



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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

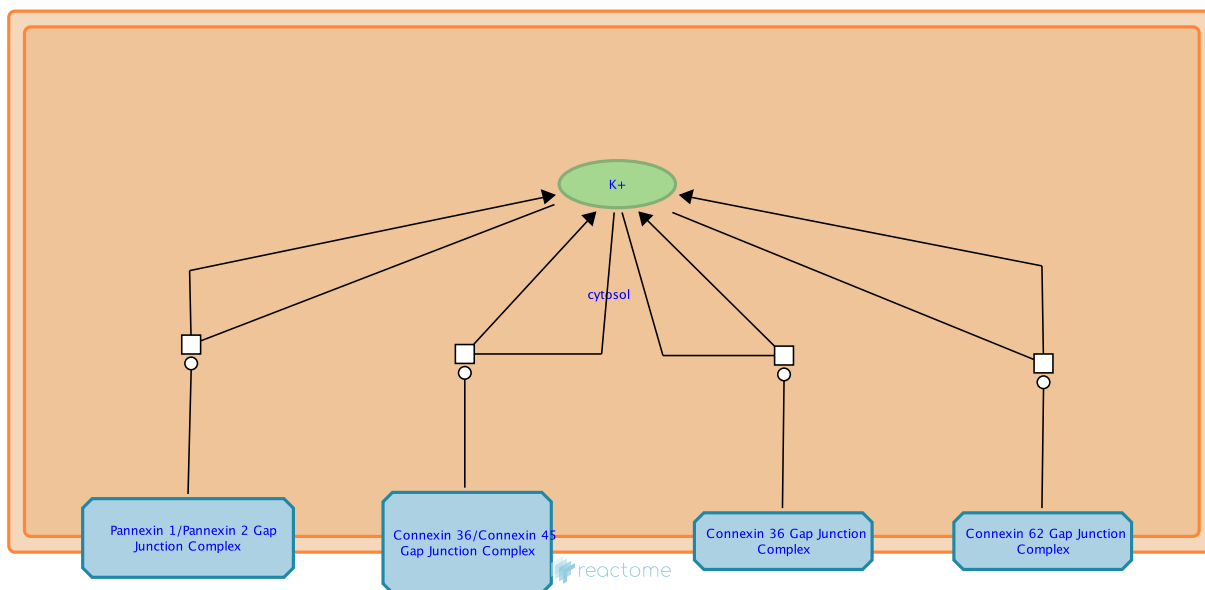
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Reactome database release: 77

This document contains 2 pathways ([see Table of Contents](#))

Transmission across Electrical Synapses ↗

Stable identifier: R-HSA-112307



Electrical transmission across nerve cells is accomplished when the current generated in the upstream neuron spreads to the downstream neuron through a path of low electrical resistance. In neurons this is accomplished at gap junctions. Electrical synapses are found in neuronal tissue where the activity of neurons must be highly synchronized. The neurons responsible for hormone secretion from the mammalian hypothalamus are a class of highly synchronized electric neurons. Gap junctions connecting the presynaptic cell with the postsynaptic cell allow current generated in the presynaptic cell to flow directly into the postsynaptic cell. Transmission speed is dramatically increased in such a system. The junction itself is composed of two hemichannels, one each on the pre- and postsynaptic cells. These channels are composed of members of the connexin family of proteins.

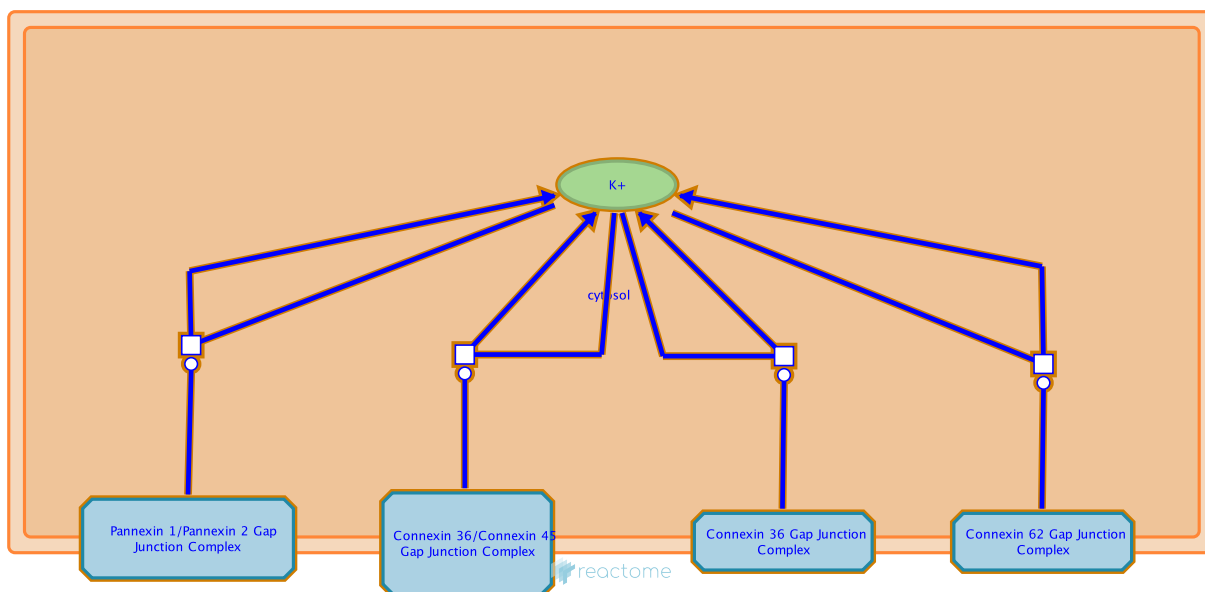
Editions

2004-04-22	Authored	Joshi-Tope, G.
2008-01-11	Reviewed	Rush, MG.
2008-01-14	Edited	Mahajan, SS.

Electric Transmission Across Gap Junctions ↗

Location: [Transmission across Electrical Synapses](#)

Stable identifier: R-HSA-112303



Electrical synapses are found in all nervous systems, including the human brain. The membranes of the two communicating neurons come extremely close at the synapse and are actually linked together by an intercellular specialization called a gap junction. Gap junctions contain precisely aligned, paired channels in the membrane of the pre- and postsynaptic neurons, such that each channel pair forms a pore. Electrical synapses thus work by allowing ionic current to flow passively through the gap junction pores from one neuron to another. Because passive current flow across the gap junction is virtually instantaneous, communication can occur without the delay that is characteristic of chemical synapses.

Editions

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