Mechanoelectrical transduction (MET) channel transports cations from the extracellular region into the cytosol of stereocilia of inner hair cell

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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**


Mechanoelectrical transduction (MET) channel transports cations from the extracellular region into the cytosol of stereocilia of inner hair cell

Stable identifier: R-HSA-9659380

Type: transition

Compartments: plasma membrane

Inferred from: MET channel transports cations from the extracellular region into the cytosol of stereocilia (Rattus norvegicus), MET channel transports cations from the extracellular region into the cytosol of stereocilia of cochlear inner hair cell (Mus musculus)

The mechanoelectrical transduction (MET) channels located at the tips of stereocilia on the apical surface of inner hair cells are opened by mechanical force exerted on the channels by CDH23:PCDH15 tip links that connect the apex of the shorter stereocilium with the side of the taller stereocilium (inferred from mouse homologs and rat homologs). A CDH23 dimer is connected to the cytoskeleton of a taller stereocilium via USH1C (Harmonin), USH1G (SANS), and MYO7A (MYOVIIA) (inferred from mouse homologs). By a calcium-dependent interaction, a CDH23 dimer on the side of a taller stereocilium is bound to a PCDH15 dimer on the apex of a shorter stereocilium that interacts, possibly via LHFPL5, with a MET channel on the shorter stereocilium (inferred from mouse homologs). The MET complex contains at least TMC1 or TMC2, TMIE, CIB2, and LHFPL5, with which PCDH15 interacts (inferred from mouse homologs). The actual pore-forming units of the complex have not yet been identified with certainty. Deflection of the stereocilia by sound causes increased tension on CDH23:PCDH15, resulting in an increased probability of the open state of the MET channel (inferred from mouse homologs and rat homologs). The MET channel is relatively non-specific for cations and allows calcium ions and potassium ions to pass from the extracellular scala media to the cytosol of the inner hair cell (inferred from mouse homologs and rat homologs). The resulting depolarization of the cell eventually results in glutamate-mediated activation of myelinated afferent neurons of the cochlear nerve.

Editions

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