

# Localization of TREK-1, a two-pore-domain K<sup>+</sup> channel in the peripheral vestibular system of mouse and rat

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The distribution of two-pore-domain (2P-domain) K<sup>+</sup> channels of the TREK subfamily was studied using immunocytochemistry in the peripheral vestibular system of mouse and rat. Using RT-PCR, the mRNA for TREK-1, but not for TREK-2 or TRAAK, were detected in mouse vestibular endorgans and ganglia. The TREK-1 channel protein was immunodetected in both nerve fibers and nerve cell bodies in the vestibular ganglion, both afferent fibers and nerve calyces innervating type I hair cells in the utricle and cristae. The post-synaptic localization in afferent calyces may suggest a neuroprotective role in glutamatergic excitotoxicity during ischemic conditions. In non-neuronal cells, TREK-1 was immunodetected in the apical membrane of dark cells and transitional cells, both of which are involved in endolymph K<sup>+</sup> secretion and recycling. TREK-1 may subserve some neuroprotective function in afferent nerve fibers as well as play a role in endolymph potassium homeostasis. © 2004 Elsevier B.V. All rights reserved.