ASIC trimers bind H+

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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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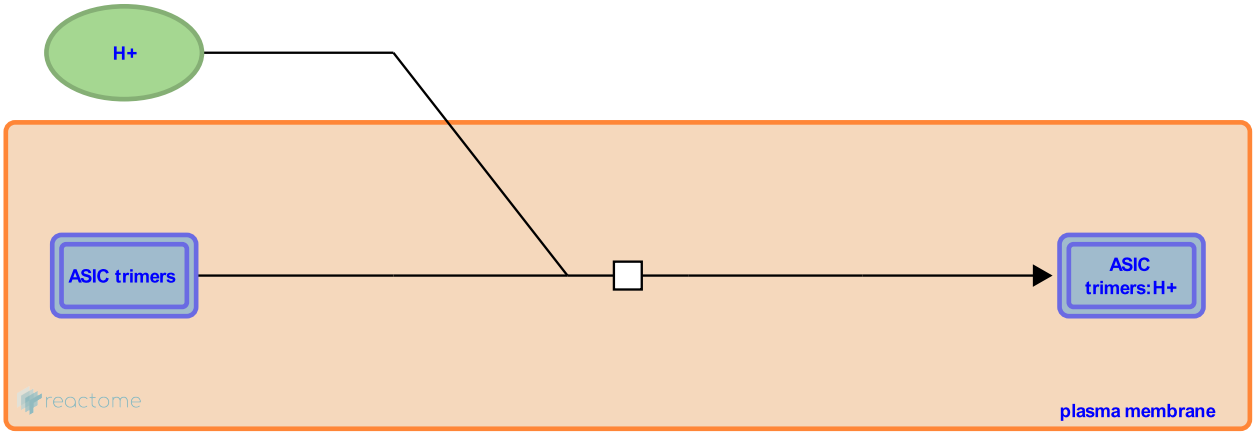
Stable identifier: R-HSA-9650165

Type: transition

Compartments: plasma membrane, extracellular region



Acid-sensing ion channels 1, 2, 3 and 5 (ASIC1, 2, 3 and 5, aka amiloride-sensitive cation channels) are homotrimeric, multi-pass membrane proteins which can transport sodium (Na+) when activated by extracellular protons. Members of the ASIC family are sensitive to amiloride and function in neurotransmission. The encoded proteins function in learning, pain transduction, touch sensation, and development of memory and fear. Many neuronal diseases cause acidosis, accompanied by pain and neuronal damage; ASICs can mediate the pathophysiological effects seen in acidiosis (Wang & Xu 2011, Qadri et al. 2012). The diuretic drug amiloride inhibits these channels, resulting in analgesic effects. NSAIDs (nonsteroidal anti-inflammatory drugs) can also inhibit ASICs to produce analgesia (Voilley et al. 2001). ASICs are also partially permeable to Ca2+, Li+ and K+ (not shown here). ASIC1 and 2 are expressed mostly in brain (Garcia-Anoveros et al. 1997, Price et al. 1996), ASIC3 is strongly expressed in testis (de Weille et al. 1998, Ishibashi & Marumo 1998) and ASIC5 is found mainly in intestine (Schaefer et al. 2000). ASIC4 subunits do not form functional channels and it's activity is unknown. It could play a part in regulating other ASIC activity (Donier et al. 2008).

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Editions

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