
Title

Piezo 1 and Piezo 2 in the Chemosensory Organs of Zebrafish (Danio rerio)

Abstract

The ion channels Piezo 1 and Piezo 2 have been identified as membrane mechano-proteins. Studying mechanosensitive channels in chemosensory organs could help in understanding the mechanisms by which these channels operate, offering new therapeutic targets for various disorders. This study investigates the expression patterns of Piezo proteins in zebrafish chemosensory organs. For the first time, Piezo protein expression in adult zebrafish chemosensory organs is reported. In the olfactory epithelium, Piezo 1 immunolabels kappe neurons, microvillous cells, and crypt neurons, while Calretinin is expressed in ciliated sensory cells. The lack of overlap between Piezo 1 and Calretinin confirms Piezo 1's specificity for kappe neurons, microvillous cells, and crypt neurons. Piezo 2 shows intense immunoreactivity in kappe neurons, one-ciliated sensory cells, and multi-ciliated sensory cells, with overlapping Calretinin expression, indicating its olfactory neuron nature. In taste buds, Piezo 1 immunolabels Merkel-like cells at the bases of cutaneous and pharyngeal taste buds and the light and dark cells of cutaneous and oral taste buds. It also marks the dark cells of pharyngeal taste buds and support cells in oral taste buds. Piezo 2 is found in the light and dark cells of cutaneous and oral taste buds and isolated chemosensory cells. These findings provide new insights into the distribution of Piezo channels in zebrafish chemosensory organs, enhancing our understanding of their sensory processing and potential therapeutic applications. © 2024 by the authors.

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35271699500; 9250039700; 7006727571; 7003300119; 7201630414; 6701668686

Year

2024

Source title

International Journal of Molecular Sciences

Volume

25.0

Issue

13.0

Art. No.

7404.0

DOI

10.3390/ijms25137404

Link

<https://www.scopus.com/inward/record.uri?eid=2-s2.0-85198452206&doi=10.3390%2fijms25137404&partnerID=40&md5=3e0404ba470c4b84323545a4f2928dfe>

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Author Keywords

isolated chemosensory cells; olfactory epithelium; Piezo 1; Piezo 2; sensory organ; taste buds; translational medicine; zebrafish

Index Keywords

Animals; Calbindin 2; Ion Channels; Olfactory Mucosa; Taste Buds; Zebrafish; Zebrafish Proteins; antibody; antigen; calretinin; ion channel; zebrafish protein; ion channel; zebrafish protein; animal cell; Article; immunoreactivity; nonhuman; olfactory epithelium; pharynx; protein expression; sense organ; sensory nerve cell; taste bud; zebra fish; animal; genetics; metabolism; olfactory mucosa; taste bud

Chemicals/CAS

Calbindin 2, ; Ion Channels, ; Zebrafish Proteins,

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Publisher

Multidisciplinary Digital Publishing Institute (MDPI)

ISSN

16616596

PubMed ID

39000511.0

Language of Original Document

English

Abbreviated Source Title

Int. J. Mol. Sci.

Document Type

Article

Publication Stage

Final

Source

Scopus

EID

2-s2.0-85198452206