

[Available Issues](#) | [Instructions to Authors](#) | [Japanese](#)
>> [Publisher Site](#)Author: [ADVANCED](#)Volume Page Keyword: 
[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1880-313X

PRINT ISSN : 0388-6107

Biomedical Research

Vol. 30 (2009) , No. 2 April pp.113-119


[\[PDF \(672K\)\]](#) [\[References\]](#)

Immunohistochemical detection of ENaC β in the terminal Schwann cells associated with the periodontal Ruffini endings of the rat incisor

[Yasumasa Hitomi](#)¹⁾²⁾, [Akiko Suzuki](#)¹⁾, [Yoshiro Kawano](#)¹⁾, [Kayoko Nozawa-Inoue](#)¹⁾, [Makoto Inoue](#)²⁾ and [Takeyasu Maeda](#)¹⁾

1) Division of Oral Anatomy, Niigata University Graduate School of Medical and Dental Sciences

2) Division of Dysphagia Rehabilitation, Niigata University Graduate School of Medical and Dental Sciences

(Received January 23, 2009)

(Accepted February 9, 2009)

ABSTRACT

Epithelial sodium channels (ENaCs) are a subfamily of ion channels within the degenerin/ENaC (DEG/ENaC) superfamily. Previous studies have shown the immunolocalization of ENaC in the neural elements of the cutaneous mechanoreceptors as well as dorsal root and trigeminal ganglion neurons, indicating the involvement of this molecule in mechanotransduction. The present study examined the expression of ENaC β , a major component of ENaC protein, in the mechanoreceptive Ruffini endings in the periodontal ligament of the rat incisors by immunohistochemistry. The expression of ENaC β in the trigeminal ganglion—which innervates the periodontal Ruffini endings—was also investigated at the mRNA and protein levels. Furthermore, double staining and a nerve injury experiment were applied to clarify its detailed localization in the periodontal Ruffini endings. ENaC β immunoreaction in the trigeminal ganglion was recognizable in the comparatively large neurons which have been considered to mediate mechanotransduction. Immunohistochemistry for ENaC β demonstrated dendritic ramifications of the Ruffini endings as well as the rounded cells in the periodontal ligament. Double staining with ENaC β and either PGP9.5 or S-100 protein showed immunoreaction for ENaC β in both

the axonal and glial elements in the periodontal ligament. Some ENaC β positive cells with rounded profiles were reactive to non-specific cholinesterase activity. Furthermore, a transection of the inferior alveolar nerve failed to eliminate the rounded cells with ENaC β reaction, indicating that they were the terminal Schwann cells associated with the periodontal Ruffini endings. These findings suggest that ENaC β is a key mechanotransducing channel in the periodontal Ruffini endings. Probably, the terminal Schwann cells together with the axon terminals regulate mechanotransduction in the periodontal endings.

[\[PDF \(672K\)\]](#) [\[References\]](#)



Download Meta of Article [\[Help\]](#)

[RIS](#)

[BibTeX](#)

To cite this article:

Yasumasa Hitomi, Akiko Suzuki, Yoshiro Kawano, Kayoko Nozawa-Inoue, Makoto Inoue and Takeyasu Maeda; "Immunohistochemical detection of ENaC β in the terminal Schwann cells associated with the periodontal Ruffini endings of the rat incisor", *Biomedical Research*, Vol. **30**, pp.113-119 (2009) .

doi:10.2220/biomedres.30.113

JOI JST.JSTAGE/biomedres/30.113

Copyright (c) 2009 Biomedical Research Press



[Japan Science and Technology Information Aggregator, Electronic](#)

