

BIBLIOGRAPHY

- Akopian AN, Sivilotti L, Wood JN (1996). A tetrodotoxin-resistant voltage-gated sodium channel expressed by sensory neurons. *Nature* 379(6562):257-62.
- Akopian AN, Souslova V, England S, Okuse K, Ogata N, Ure J, et al. (1999). The tetrodotoxin-resistant sodium channel SNS has a specialized function in pain pathways. *Nat Neurosci* 2(6):541-8.
- Amalinei C, Caruntu ID, Balan RA (2007). Biology of metalloproteinases. *Rom J Morphol Embryol* 48(4):323-34.
- Amaya F, Decosterd I, Samad TA, Plumpton C, Tate S, Mannion RJ, et al. (2000). Diversity of expression of the sensory neuron-specific TTX-resistant voltage-gated sodium ion channels SNS and SNS2. *Mol Cell Neurosci* 15(4):331-42.
- Amaya F, Wang H, Costigan M, Allchorne AJ, Hatcher JP, Egerton J, et al. (2006). The voltage-gated sodium channel Na(v)1.9 is an effector of peripheral inflammatory pain hypersensitivity. *J Neurosci* 26(50):12852-60.
- Amir R, Argoff CE, Bennett GJ, Cummins TR, Durieux ME, Gerner P, et al. (2006). The role of sodium channels in chronic inflammatory and neuropathic pain. *J Pain* 7(5 Suppl 3):S1-29.
- Awawdeh L, Lundy FT, Shaw C, Lamey PJ, Linden GJ, Kennedy JG (2002). Quantitative analysis of substance P, neurokinin A and calcitonin gene-related peptide in pulp tissue from painful and healthy human teeth. *Int Endod J* 35(1):30-6.

- Back M, Ketelhuth DF, Agewall S (2010). Matrix metalloproteinases in atherothrombosis. *Prog Cardiovasc Dis* 52(5):410-28.
- Beneng K, Renton T, Yilmaz Z, Yiangou Y, Anand P (2010). Sodium channel Nav 1.7 immunoreactivity in painful human dental pulp and burning mouth syndrome. *BMC Neurosci* 8(11):71.
- Benn SC, Costigan M, Tate S, Fitzgerald M, Woolf CJ (2001). Developmental expression of the TTX-resistant voltage-gated sodium channels Nav1.8 (SNS) and Nav1.9 (SNS2) in primary sensory neurons. *J Neurosci* 21(16):6077-85.
- Brüünsgaard H, Pedersen BK (2003). Age-related inflammatory cytokines and disease. *Immunol Allergy Clin North Am* 23(1):15-39.
- Byers MR, Schatteman GC, Bothwell M (1990a). Multiple functions for NGF receptor in developing, aging and injured rat teeth are suggested by epithelial, mesenchymal and neural immunoreactivity. *Development* 109(2):461-71.
- Byers MR, Taylor PE, Khayat BG, Kimberly CL (1990b). Effects of injury and inflammation on pulpal and periapical nerves. *J Endod* 16(2):78-84.
- Byers MR, Wheeler EF, Bothwell M (1992). Altered expression of NGF and P75 NGF-receptor by fibroblasts of injured teeth precedes sensory nerve sprouting. *Growth Factors* 6(1):41-52.
- Byers MR, Taylor PE (1993). Effect of sensory denervation on the response of rat molar pulp to exposure injury. *J Dent Res* 72(3):613-8.
- Byers MR, Narhi MV (1999). Dental injury models: experimental tools for understanding neuroinflammatory interactions and polymodal nociceptor functions. *Crit Rev Oral Biol Med* 10(1):4-39.

Byers MR, Narhi MVO (2002). Nerves Supply of the Pulpodentin Complex and Responses to Injury In: Seltzer and Bender's Dental Pulp LC Bywaters editor: Quintessence Publishing Co, Inc pp. 151-180.

Byers MR, Suzuki H, Maeda T (2003). Dental neuroplasticity, neuro-pulpal interactions, and nerve regeneration. *Microsc Res Tech* 60(5):503-15.

Byers MR, Rafie MM, Westenbroek RE (2009). Dexamethasone effects on Na(v)1.6 in tooth pulp, dental nerves, and alveolar osteoclasts of adult rats. *Cell Tissue Res* 338(2):217-26.

Caviedes-Bucheli J, Camargo-Beltran C, Gomez-la-Rotta AM, Moreno SC, Abello GC, Gonzalez-Escobar JM (2004). Expression of calcitonin gene-related peptide (CGRP) in irreversible acute pulpitis. *J Endod* 30(4):201-4.

Caviedes-Bucheli J, Munoz HR, Azuero-Holguin MM, Ulate E (2008). Neuropeptides in dental pulp: the silent protagonists. *J Endod* 34(7):773-88.

Chakraborti S, Mandal M, Das S, Mandal A, Chakraborti T (2003). Regulation of matrix metalloproteinases: an overview. *Mol Cell Biochem* 253(1-2):269-85.

Chang YC, Lai CC, Yang SF, Chan Y, Hsieh YS (2002). Stimulation of matrix metalloproteinases by black-pigmented Bacteroides in human pulp and periodontal ligament cell cultures. *J Endod* 28(2):90-3.

Chevrier P, Vijayaragavan K, Chahine M (2004). Differential modulation of Nav1.7 and Nav1.8 peripheral nerve sodium channels by the local anesthetic lidocaine. *Br J Pharmacol* 142(3):576-84.

Classification of chronic pain (1994). Descriptions of Chronic Pain Syndromes and Definitions of Pain Terms. In: H Merskey and N Bogduk editors. Seattle: IASP Press.

- Coggeshall RE, Tate S, Carlton SM (2004). Differential expression of tetrodotoxin-resistant sodium channels Nav1.8 and Nav1.9 in normal and inflamed rats. *Neurosci Lett* 355(1-2):45-8.
- Coward K, Plumpton C, Facer P, Birch R, Carlstedt T, Tate S, et al. (2000). Immunolocalization of SNS/PN3 and NaN/SNS2 sodium channels in human pain states. *Pain* 85(1-2):41-50.
- Cummins TR, Sheets PL, Waxman SG (2007). The roles of sodium channels in nociception: Implications for mechanisms of pain. *Pain* 131(3):243-57.
- Deryugina EI, Quigley JP (2006). Matrix metalloproteinases and tumor metastasis. *Cancer Metastasis Rev* 25(1):9-34.
- Devor M (2006). Sodium channels and mechanisms of neuropathic pain. *J Pain* 7(1 Suppl 1):S3-S12.
- Dib-Hajj SD, Tyrrell L, Black JA, Waxman SG (1998). NaN, a novel voltage-gated Na channel, is expressed preferentially in peripheral sensory neurons and down-regulated after axotomy. *Proc Natl Acad Sci U S A* 95(15):8963-8.
- Eder C (2005). Regulation of microglial behavior by ion channel activity. *J Neurosci Res* 81(3):314-21.
- Egan CA, Bishop MA, Hector MP (1996). An immunohistochemical study of the pulpal nerve supply in primary human teeth: evidence for the innervation of deciduous dentine. *J Anat* 188 (Pt 3):623-31.
- England S, Bevan S, Docherty RJ (1996). PGE2 modulates the tetrodotoxin-resistant sodium current in neonatal rat dorsal root ganglion neurones via the cyclic AMP-protein kinase A cascade. *J Physiol* 495 (Pt 2):429-40.

- Esmaeili A, Akhavan A, Bouzari M, Mousavi SB, Torabinia N, Adibi S (2011). Temporal expression pattern of sodium channel Nav 1.8 messenger RNA in pulpitis. *Int Endod J* 44(6):499-504.
- Garra G, Singer AJ, Taira BR, Chohan J, Cardoz H, Chisena E, et al (2010). Validation of the Wong-Baker FACES Pain Rating Scale in pediatric emergency department patients. *Acad Emerg Med* 17(1):50-4.
- Gold MS (1999). Tetrodotoxin-resistant Na⁺ currents and inflammatory hyperalgesia. *Proc Natl Acad Sci U S A* 96(14):7645-9.
- Goodman BE (2008). Channels active in the excitability of nerves and skeletal muscles across the neuromuscular junction: basic function and pathophysiology. *Adv Physiol Educ* 32(2):127-35.
- Gusman H, Santana RB, Zehnder M (2002). Matrix metalloproteinase levels and gelatinolytic activity in clinically healthy and inflamed human dental pulps. *Eur J Oral Sci* 110(5):353-7.
- Hannas AR, Pereira JC, Granjeiro JM, Tjaderhane L (2007). The role of matrix metalloproteinases in the oral environment. *Acta Odontol Scand* 65(1):1-13.
- Harvima IT (2008). Induction of matrix metalloproteinase-9 in keratinocytes by histamine. *J Invest Dermatol* 128(12):2748-50.
- Haug SR, Heyeraas KJ (2006). Modulation of dental inflammation by the sympathetic nervous system. *J Dent Res* 85(6):488-95.
- Henry MA, Sorensen HJ, Johnson LR, Levinson SR (2005). Localization of the Nav1.8 sodium channel isoform at nodes of Ranvier in normal human radicular tooth pulp. *Neurosci Lett* 380(1-2):32-6.

- Henry MA, Luo S, Foley BD, Rzasa RS, Johnson LR, Levinson SR (2009). Sodium channel expression and localization at demyelinated sites in painful human dental pulp. *J Pain* 10(7):750-8.
- Hicks CL, von Baeyer CL, Spafford PA, van Korlaar I, Goodenough B (2001). The Faces Pain Scale-Revised: toward a common metric in pediatric pain measurement. *Pain* 93(2):173-83.
- Hildebrand C, Fried K, Tuisku F, Johansson CS (1995). Teeth and tooth nerves. *Prog Neurobiol* 45(3):165-222.
- Hulejova H, Baresova V, Klezl Z, Polanska M, Adam M, Senolt L (2007). Increased level of cytokines and matrix metalloproteinases in osteoarthritic subchondral bone. *Cytokine* 38(3):151-6.
- John A, Tuszynski G (2001). The role of matrix metalloproteinases in tumor angiogenesis and tumor metastasis. *Pathol Oncol Res* 7(1):14-23.
- Johnsen D, Johns S (1978). Quantitation of nerve fibres in the primary and permanent canine and incisor teeth in man. *Arch Oral Biol* 23(9):825-9.
- Joshi SK, Mikusa JP, Hernandez G, Baker S, Shieh CC, Neelands T, et al. (2006). Involvement of the TTX-resistant sodium channel Nav 1.8 in inflammatory and neuropathic, but not post-operative, pain states. *Pain* 123(1-2):75-82.
- Khasar SG, Gold MS, Levine JD (1998). A tetrodotoxin-resistant sodium current mediates inflammatory pain in the rat. *Neurosci Lett* 256(1):17-20.
- Khayat BG, Byers MR, Taylor PE, Mecifi K, Kimberly CL (1988). Responses of nerve fibers to pulpal inflammation and periapical lesions in rat molars demonstrated by calcitonin gene-related peptide immunocytochemistry. *J Endod* 14(12):577-87.

- Kim CH, Oh Y, Chung JM, Chung K (2001). The changes in expression of three subtypes of TTX sensitive sodium channels in sensory neurons after spinal nerve ligation. *Brain Res Mol Brain Res* 95(1-2):153-61.
- Kim S (1990). Neurovascular interactions in the dental pulp in health and inflammation. *J Endod* 16(2):48-53.
- Krafte DS, Bannon AW (2008). Sodium channels and nociception: recent concepts and therapeutic opportunities. *Curr Opin Pharmacol* 8(1):50-6.
- Kwong K, Lee LY (2005). Prostaglandin E2 potentiates a TTX-resistant sodium current in rat capsaicin-sensitive vagal pulmonary sensory neurones. *J Physiol* 564 (Pt 2):437-50.
- Lagente V, Boichot E (2010). Role of matrix metalloproteinases in the inflammatory process of respiratory diseases. *J Mol Cell Cardiol* 48(3):440-4.
- Leffler A, Reiprich A, Mohapatra DP, Nau C (2007). Use-dependent block by lidocaine but not amitriptyline is more pronounced in tetrodotoxin (TTX)-Resistant $Na_v1.8$ than in TTX-sensitive Na^+ channels. *J Pharmacol Exp Ther* 320(1):354-64.
- Leppert D, Lindberg RL, Kappos L, Leib SL (2001). Matrix metalloproteinases: multifunctional effectors of inflammation in multiple sclerosis and bacterial meningitis. *Brain Res Brain Res Rev* 36(2-3):249-57.
- Liu M, Sun H, Wang X, Koike T, Mishima H, Ikeda K, et al. (2004). Association of increased expression of macrophage elastase (matrix metalloproteinase 12) with rheumatoid arthritis. *Arthritis Rheum* 50(10):3112-7.

- Luo S, Perry GM, Levinson SR, Henry MA (2010). Pulpitis increases the proportion of atypical nodes of Ranvier in human dental pulp axons without a change in Nav1.6 sodium channel expression. *Neuroscience* 169(4):1881-7.
- Luo S, Perry GM, Levinson SR, Henry MA (2008). Nav1.7 expression is increased in painful human dental pulp. *Mol Pain* 21(4):16.
- Maingret F, Coste B, Padilla F, Clerc N, Crest M, Korogod SM, et al. (2008). Inflammatory mediators increase Nav1.9 current and excitability in nociceptors through a coincident detection mechanism. *J Gen Physiol* 131(3):211-25.
- Manicone AM, McGuire JK (2008). Matrix metalloproteinases as modulators of inflammation. *Semin Cell Dev Biol* 19(1):34-41.
- Menshikov MY, Elizarova EP, Kudryashova E, Timofeyeva AV, Khaspekov Y, Beabealashvilly RS, et al. (2001). Plasmin-independent gelatinase B (matrix metalloproteinase-9) release by monocytes under the influence of urokinase. *Biochemistry (Mosc)* 66(9):954-9.
- Monteiro J, Day P, Duggal M, Morgan C, Rodd H (2009). Pulpal status of human primary teeth with physiological root resorption. *Int J Paediatr Dent* 19(1):16-25.
- Nassar MA, Stirling LC, Forlani G, Baker MD, Matthews EA, Dickenson AH, et al. (2004). Nociceptor-specific gene deletion reveals a major role for Nav1.7 (PN1) in acute and inflammatory pain. *Proc Natl Acad Sci U S A* 101(34):12706-11.

- Newman CJ, Lolekha R, Limkittikul K, Luangxay K, Chotpitayasunondh T, Chanthavanich P (2005). A comparison of pain scales in Thai children. *Arch Dis Child* 90(3):269-70.
- O'Boskey FJ, Jr., Panagakos FS (1998). Cytokines stimulate matrix metalloproteinase production by human pulp cells during long-term culture. *J Endod* 24(1):7-10.
- O'Rourke D (2004). The measurement of pain in infants, children, and adolescents: from policy to practice. *Phys Ther* 84(6):560-70.
- Okawa K, Ichinohe T, Kaneko Y (2005). Anxiety may enhance pain during dental treatment. *Bull Tokyo Dent Coll* 46(3):51-8.
- Okiji T, Jontell M, Belichenko P, Dahlgren U, Bergenholtz G, Dahlstrom A (1997). Structural and functional association between substance P- and calcitonin gene-related peptide-immunoreactive nerves and accessory cells in the rat dental pulp. *J Dent Res* 76(12):1818-24.
- Olgart L, Kerezoudis NP (1994). Nerve-pulp interactions. *Arch Oral Biol* 39 Suppl:47S-54S.
- Opendakker G, Van den Steen PE, Dubois B, Nelissen I, Van Coillie E, Masure S, et al. (2001). Gelatinase B functions as regulator and effector in leukocyte biology. *J Leukoc Biol* 69(6):851-9.
- Padilla F, Couble ML, Coste B, Maingret F, Clerc N, Crest M, et al. (2007). Expression and localization of the Nav1.9 sodium channel in enteric neurons and in trigeminal sensory endings: implication for intestinal reflex function and orofacial pain. *Mol Cell Neurosci* 35(1):138-52.

- Panagakos FS, O'Boskey JF, Jr., Rodriguez E (1996). Regulation of pulp cell matrix metalloproteinase production by cytokines and lipopolysaccharides. *J Endod* 22(7):358-61.
- Pashley DH (1996). Dynamics of the pulpo-dentin complex. *Crit Rev Oral Biol Med* 7(2):104-33.
- Porreca F, Lai J, Bian D, Wegert S, Ossipov MH, Eglen RM, et al. (1999). A comparison of the potential role of the tetrodotoxin-insensitive sodium channels, PN3/SNS and NaN/SNS2, in rat models of chronic pain. *Proc Natl Acad Sci U S A* 96(14):7640-4.
- Powell CV, Kelly AM, Williams A (2001). Determining the minimum clinically significant difference in visual analog pain score for children. *Ann Emerg Med* 37(1):28-31.
- Pugin J, Widmer MC, Kossodo S, Liang CM, Preas HLn, Suffredini AF (1999). Human neutrophils secrete gelatinase B *In Vitro* and *In Vivo* in response to endotoxin and proinflammatory mediators. *Am J Respir Cell Mol Biol* 20(3):458-64.
- Renganathan M, Cummins TR, Waxman SG (2001). Contribution of Na(v)1.8 sodium channels to action potential electrogenesis in DRG neurons. *J Neurophysiol* 86(2):629-40.
- Renton T, Yiangou Y, Plumpton C, Tate S, Bountra C, Anand P (2005). Sodium channel Na_v1.8 immunoreactivity in painful human dental pulp. *BMC Oral Health* 5(1):5.
- Rodd HD, Boissonade FM (2000). Substance P expression in human tooth pulp in relation to caries and pain experience. *Eur J Oral Sci* 108(6):467-74.

- Rodd HD, Boissonade FM (2001). Innervation of human tooth pulp in relation to caries and dentition type. *J Dent Res* 80(1):389-93.
- Rodd HD, Boissonade FM (2002). Comparative immunohistochemical analysis of the peptidergic innervation of human primary and permanent tooth pulp. *Arch Oral Biol* 47(5):375-85.
- Rodd HD, Boissonade FM (2003). Immunocytochemical investigation of neurovascular relationships in human tooth pulp. *J Anat* 202(2):195-203.
- Sari S, Aras S, Gunhan O (1999). The effect of physiological root resorption on the histological structure of primary tooth pulp. *J Clin Pediatr Dent* 23(3):221-5.
- Scholz A, Kuboyama N, Hempelmann G, Vogel W (1998). Complex blockade of TTX-resistant Na⁺ currents by lidocaine and bupivacaine reduce firing frequency in DRG neurons. *J Neurophysiol* 79(4):1746-54.
- Shields BJ, Cohen DM, Harbeck-Weber C, Powers JD, Smith GA (2003a). Pediatric pain measurement using a visual analogue scale: a comparison of two teaching methods. *Clin Pediatr (Phila)* 42(3):227-34.
- Shields BJ, Palermo TM, Powers JD, Grewe SD, Smith GA (2003b). Predictors of a child's ability to use a visual analogue scale. *Child Care Health Dev* 29(4):281-90.
- Shin SJ, Lee JI, Baek SH, Lim SS (2002). Tissue levels of matrix metalloproteinases in pulps and periapical lesions. *J Endod* 28(4):313-5.
- Shoshani Y, Pe'er J, Doviner V, Frucht-Pery J, Solomon A (2005). Increased expression of inflammatory cytokines and matrix metalloproteinases in pseudophakic corneal edema. *Invest Ophthalmol Vis Sci* 46(6):1940-7.

Siqueira SR, Alves B, Malpartida HM, Teixeira MJ, Siqueira JT (2009). Abnormal expression of voltage-gated sodium channels Nav1.7, Nav1.3 and Nav1.8 in trigeminal neuralgia. *Neuroscience* 164(2):573-7.

Soetenga D, Frank J, Pellino TA (1999). Assessment of the validity and reliability of the University of Wisconsin Children's Hospital Pain scale for Preverbal and Nonverbal Children. *Pediatr Nurs* 25(6):670-6.

Strickland IT, Martindale JC, Woodhams PL, Reeve AJ, Chessell IP, McQueen DS (2008). Changes in the expression of Nav1.7, Nav1.8 and Nav1.9 in a distinct population of dorsal root ganglia innervating the rat knee joint in a model of chronic inflammatory joint pain. *Eur J Pain* 12(5):564-72.

Tate S, Benn S, Hick C, Trezise D, John V, Mannion RJ, et al. (1998). Two sodium channels contribute to the TTX-R sodium current in primary sensory neurons. *Nat Neurosci* 1(8):653-5.

Taylor PE, Byers MR, Redd PE (1988). Sprouting of CGRP nerve fibers in response to dentin injury in rat molars. *Brain Res* 461(2):371-6.

Tezuka K, Nemoto K, Tezuka Y, Sato T, Ikeda Y, Kobori M, et al. (1994). Identification of matrix metalloproteinase-9 in rabbit osteoclasts. *J Biol Chem* 269(21):15006-9.

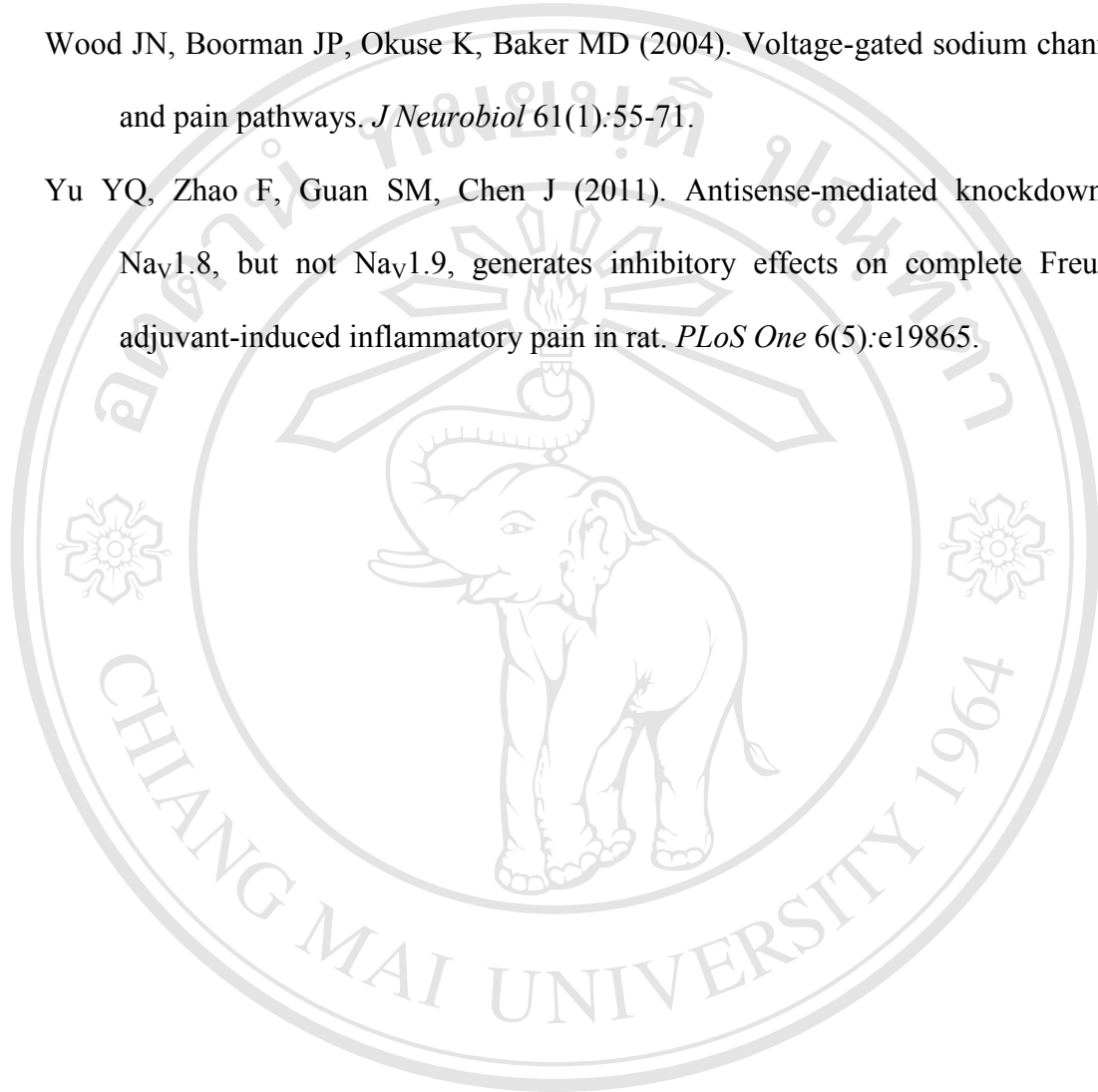
Thakor DK, Lin A, Matsuka Y, Meyer EM, Ruangsri S, Nishimura I, et al. (2009). Increased peripheral nerve excitability and local Nav1.8 mRNA up-regulation in painful neuropathy. *Mol Pain* 25(5):14.

- Tsai CH, Hsieh YS, Yang SF, Chou MY, Chang YC (2003). Matrix metalloproteinase-2 and matrix metalloproteinase-9 expression in human oral squamous cell carcinoma and the effect of protein kinase C inhibitors: preliminary observations. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 95(6):710-6.
- Tsai CH, Chen YJ, Huang FM, Su YF, Chang YC (2005). The upregulation of matrix metalloproteinase-9 in inflamed human dental pulps. *J Endod* 31(12):860-2.
- Versloot J, Veerkamp JS, Hoogstraten J (2008). Children's self-reported pain at the dentist. *Pain* 137(2):389-94.
- Visse R, Nagase H (2003). Matrix metalloproteinases and tissue inhibitors of metalloproteinases: structure, function, and biochemistry. *Circ Res* 92(8):827-39.
- Warren CA, Mok L, Gordon S, Fouad AF, Gold MS (2008). Quantification of neural protein in extirpated tooth pulp. *J Endod* 34(1):7-10.
- Wells JE, Bingham V, Rowland KC, Hatton J (2007a). Expression of Nav1.9 channels in human dental pulp and trigeminal ganglion. *J Endod* 33(10):1172-6.
- Wells JE, Rose ET, Rowland KC, Hatton JF (2007b). Kv1.4 subunit expression is decreased in neurons of painful human pulp. *J Endod* 33(7):827-9.
- Wilson MJ, Sellers RG, Wiehr C, Melamud O, Pei D, Peehl DM (2002). Expression of matrix metalloproteinase-2 and -9 and their inhibitors, tissue inhibitor of metalloproteinase-1 and -2, in primary cultures of human prostatic stromal and epithelial cells. *J Cell Physiol* 191(2):208-16.

Woessner JF, Jr. (1991). Matrix metalloproteinases and their inhibitors in connective tissue remodeling. *FASEB J* 5(8):2145-54.

Wood JN, Boorman JP, Okuse K, Baker MD (2004). Voltage-gated sodium channels and pain pathways. *J Neurobiol* 61(1):55-71.

Yu YQ, Zhao F, Guan SM, Chen J (2011). Antisense-mediated knockdown of $Na_v1.8$, but not $Na_v1.9$, generates inhibitory effects on complete Freund's adjuvant-induced inflammatory pain in rat. *PLoS One* 6(5):e19865.



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved