

# BIBLIOGRAPHY

---

- Acute Pain Management Guideline P: Acute pain Management: Operative or medical procedures and Trauma. Clinical Practice Guideline. 1992. edited by U. S. D. o. H. a. H. Services: Agency for Health Care Policy and Research, Public Health Service, Rockville, MD.
- Aanonsen LM, Wilcox GL. 1989. Muscimol, gamma-aminobutyric acidA receptors and excitatory amino acids in the mouse spinal cord. *J Pharmacol Exp Ther* 248 (3):1034-8.
- Abbott FV, Franklin KB, Westbrook RF. 1995. The formalin test: scoring properties of the first and second phases of the pain response in rats. *Pain* 60 (1):91-102.
- Abbott FV, Ocvirk R, Najafee R, Franklin KB. 1999. Improving the efficiency of the formalin test. *Pain* 83 (3):561-9.
- Abbott NJ, Ronnback L, Hansson E. 2006. Astrocyte-endothelial interactions at the blood-brain barrier. *Nat Rev Neurosci* 7 (1):41-53.
- Aley KO, Reichling DB, Levine JD. 1996. Vincristine hyperalgesia in the rat: a model of painful vincristine neuropathy in humans. *Neuroscience* 73 (1):259-65.
- Allen, AR. 1911. Surgery of experimental lesion of spinal cord equivalent to crush injury of fracture dislocation of spinal column. *J. Am. Med. Assoc.* 57:878-880.
- Al-Saffar FJ, Ganabadi S, Fakurazi S, Yaakub H, Lip M. 2010. Chondroprotective effect of Zerumbone on monosodium iodoacetate induced osteoarthritis in rats. *Journal of Applied Sciences* 4 (248-260).
- Amir R, Devor M. 1993. Ongoing activity in neuroma afferents bearing retrograde sprouts. *Brain Res* 630 (1-2):283-8.
- . 2000. Functional cross-excitation between afferent A- and C-neurons in dorsal root ganglia. *Neuroscience* 95 (1):189-95.
- Amir R, Michaelis M, Devor M. 1999. Membrane potential oscillations in dorsal root ganglion neurons: role in normal electrogenesis and neuropathic pain. *J Neurosci* 19 (19):8589-96.
- Araque A, Sanzgiri, RP, Parpura V, Haydon PG. 1999. Astrocyte-induced modulation of synaptic transmission. *Can J Physiol Pharmacol* 77 (9):699-706.
- Arezzo JC, Zotova E. 2002. Electrophysiologic measures of diabetic neuropathy: mechanism and meaning. *Int Rev Neurobiol* 50:229-55.
- Arruda JL, Colburn RW, Rickman AJ, Rutkowski MD, DeLeo JA. 1998. Increase of interleukin-6 mRNA in the spinal cord following peripheral nerve injury in the rat: potential role of IL-6 in neuropathic pain. *Brain Res Mol Brain Res* 62 (2):228-35.
- Attal N, Bouhassira D. 1999. Mechanisms of pain in peripheral neuropathy. *Acta Neurol Scand Suppl* 173:12-24; discussion 48-52.

- Attal N, Chen YL, Kayser V, Guilbaud G. 1991. Behavioural evidence that systemic morphine may modulate a phasic pain-related behaviour in a rat model of peripheral mononeuropathy. *Pain* 47 (1):65-70.
- Attal N, Jazat F, Kayser V, Guilbaud G. 1990. Further evidence for 'pain-related' behaviours in a model of unilateral peripheral mononeuropathy. *Pain* 41 (2):235-51.
- Austin PJ, Moalem-Taylor G. 2010. The neuro-immune balance in neuropathic pain: involvement of inflammatory immune cells, immune-like glial cells and cytokines. *J Neuroimmunol* 229 (1-2):26-50.
- Authier N, Fialip J, Eschalier A, Coudore F. 2000. Assessment of allodynia and hyperalgesia after cisplatin administration to rats. *Neurosci Lett* 291 (2):73-6.
- Baccaglini PI, Hogan PG. 1983. Some rat sensory neurons in culture express characteristics of differentiated pain sensory cells. *Proc Natl Acad Sci U S A* 80 (2):594-8.
- Baccei ML, Kocsis JD. 2000. Voltage-gated calcium currents in axotomized adult rat cutaneous afferent neurons. *J Neurophysiol* 83 (4):2227-38.
- Back SK, Sung B, Hong SK, Na HS. 2002. A mouse model for peripheral neuropathy produced by a partial injury of the nerve supplying the tail. *Neurosci Lett* 322 (3):153-6.
- Bajrovic F, Sketelj J. 1998. Extent of nociceptive dermatomes in adult rats is not primarily maintained by axonal competition. *Exp Neurol* 150 (1):115-21.
- Balentine, JD. 1978. Pathology of experimental spinal cord trauma. I. The necrotic lesion as a function of vascular injury. *Lab Invest* 39 (3):236-53.
- Ballou LR, Botting RM, Goorha S, Zhang J, Vane JR. 2000. Nociception in cyclooxygenase isozyme-deficient mice. *Proc Natl Acad Sci U S A* 97 (18):10272-6.
- Banati, RB. 2002. Visualising microglial activation in vivo. *Glia* 40 (2):206-17.
- Basbaum AI, Bautista DM, Scherrer G, Julius D. 2009. Cellular and molecular mechanisms of pain. *Cell* 139 (2):267-84.
- Basbaum AI, Gautron M, Jazat F, Mayes M, Guilbaud G. 1991. The spectrum of fiber loss in a model of neuropathic pain in the rat: an electron microscopic study. *Pain* 47 (3):359-67.
- Basbaum AI, Jessell T. 2000. *The Perception of Pain*. Edited by S. J. Kandel E.R., Jessell T., *Principles of Neuroscience*. New York: Appleton and Lange.
- Bass WB, Vander Brook MJ. 1952. A note on an improved method of analgetic evaluation. *J Am Pharm Assoc Am Pharm Assoc (Baltim)* 41 (10):569-70.
- Ben-Bassat J, Peretz E, Sulman FG. 1959. Analgesimetry and ranking of analgesic drugs by the receptacle method. *Arch Int Pharmacodyn Ther* 122:434-47.
- Bendele, AM. 2001. Animal models of osteoarthritis. *J Musculoskelet Neuronal Interact* 1 (4):363-76.
- Bendele A, McComb J, Gould T, McAbee T, Sennello G, Chlipala E, Guy M. 1999. Animal models of arthritis: relevance to human disease. *Toxicol Pathol* 27 (1):134-42.
- Bendele AM, Hulman JF. 1988. Spontaneous cartilage degeneration in guinea pigs. *Arthritis Rheum* 31 (4):561-5.

- Bennett, GJ. 1994. *Neuropathic pain*. Edited by M. R. Wall P.D. 3rd ed, *Textbook of Pain*. Churchill Livingstone, Edinburgh.
- Bennett GJ, Xie YK. 1988. A peripheral mononeuropathy in rat that produces disorders of pain sensation like those seen in man. *Pain* 33 (1):87-107.
- Bentley GA, Newton SH, Starr J. 1983. Studies on the antinociceptive action of alpha-agonist drugs and their interactions with opioid mechanisms. *Br J Pharmacol* 79 (1):125-34.
- Berge, OG. 2011. Predictive validity of behavioural animal models for chronic pain. *Br J Pharmacol* 164 (4):1195-206.
- Besson, JM. 1999. The neurobiology of pain. *Lancet* 353 (9164):1610-5.
- Beyreuther BK, Callizot N, Brot MD, Feldman R, Bain SC, Stohr T. 2007. Antinociceptive efficacy of lacosamide in rat models for tumor- and chemotherapy-induced cancer pain. *Eur J Pharmacol* 565 (1-3):98-104.
- Biella G, Riva L, Sotgiu ML. 1997. Interaction between neurons in different laminae of the dorsal horn of the spinal cord. A correlation study in normal and neuropathic rats. *Eur J Neurosci* 9 (5):1017-25.
- Bishnoi M, Bosgraaf CA, Abooj M, Zhong L, Premkumar LS. 2011. Streptozotocin-induced early thermal hyperalgesia is independent of glycemic state of rats: role of transient receptor potential vanilloid 1 (TRPV1) and inflammatory mediators. *Mol Pain* 7:52.
- Bley KR, Hunter JC, Eglen RM, Smith JA. 1998. The role of IP prostanoid receptors in inflammatory pain. *Trends Pharmacol Sci* 19 (4):141-7.
- Blomstrand F, Giaume C, Hansson E, Ronnback L. 1999. Distinct pharmacological properties of ET-1 and ET-3 on astroglial gap junctions and Ca(2+) signaling. *Am J Physiol* 277 (4 Pt 1):C616-27.
- Bolay H, Moskowitz MA. 2002. Mechanisms of pain modulation in chronic syndromes. *Neurology* 59 (5 Suppl 2):S2-7.
- Bridges D, Thompson SW, Rice AS. 2001. Mechanisms of neuropathic pain. *Br J Anaesth* 87 (1):12-26.
- Bujalska M, Gumulka SW. 2008. Effect of cyclooxygenase and nitric oxide synthase inhibitors on vincristine induced hyperalgesia in rats. *Pharmacol Rep* 60 (5):735-41.
- Bujalska M, Tatarkiewicz J, de Corde A, Gumulka S.W. 2008. Effect of cyclooxygenase and nitric oxide synthase inhibitors on streptozotocin-induced hyperalgesia in rats. *Pharmacology* 81 (2):151-7.
- Bushong EA, Martone ME, Jones YZ, Ellisman MH. 2002. Protoplasmic astrocytes in CA1 stratum radiatum occupy separate anatomical domains. *J Neurosci* 22 (1):183-92.
- Calcutt, NA. 2004. Experimental models of painful diabetic neuropathy. *J Neurol Sci* 220 (1-2):137-9.
- Cameron M, Gagnier JJ, Little CV, Parsons TJ, Blumle A, Chrubasik S. 2009. Evidence of effectiveness of herbal medicinal products in the treatment of arthritis. Part 2: Rheumatoid arthritis. *Phytother Res* 23 (12):1647-62.
- . 2009. Evidence of effectiveness of herbal medicinal products in the treatment of arthritis. Part I: Osteoarthritis. *Phytother Res* 23 (11):1497-515.

- Campbell JN, Raja SN, Meyer RA, Mackinnon SE. 1988. Myelinated afferents signal the hyperalgesia associated with nerve injury. *Pain* 32 (1):89-94.
- Cavaletti G, Tredici G, Braga M, Tazzari S. 1995. Experimental peripheral neuropathy induced in adult rats by repeated intraperitoneal administration of taxol. *Exp Neurol* 133 (1):64-72.
- Cevallos, EA. 1996. "BIRM: La esragia terapeutica del futuro". Paper read at Congreso Mundial de SIDA, at Vancouver.
- Cevallos-Arellano, E. 1994. Binational experience in the treatment of AIDS with a low molecular weight natural carbohydrate (ECA-10-142) as a stimulant of the immune system. Tenth International Conference on AIDS (Yokohama, Japan).
- Chacur M, Milligan ED, Gazda LS, Armstrong C, Wang H, Tracey KJ, Maier SF, Watkins LR. 2001. A new model of sciatic inflammatory neuritis (SIN): induction of unilateral and bilateral mechanical allodynia following acute unilateral peri-sciatic immune activation in rats. *Pain* 94 (3):231-44.
- Chaplan SR, Bach FW, Pogrel J W, Chung JM, Yaksh TL. 1994. Quantitative assessment of tactile allodynia in the rat paw. *J Neurosci Methods* 53 (1):55-63.
- Chau, TT. 1989. *Analgesic testing in animal models. In: Pharmacological methods in the control of inflammation.* Edited by A. R: Liss, Inc.
- Choi Y, Yoon YW, Na HS, Kim, SH, Chung, JM. 1994. Behavioral signs of ongoing pain and cold allodynia in a rat model of neuropathic pain. *Pain* 59 (3):369-76.
- Chuang HH, Prescott ED, Kong H, Shields S, Jordt SE, Basbaum AI, Chao MV, Julius D. 2001. Bradykinin and nerve growth factor release the capsaicin receptor from PtdIns(4,5)P<sub>2</sub>-mediated inhibition. *Nature* 411 (6840):957-62.
- Chung K, Kim HJ, Na HS, Park MJ, Chung JM. 1993. Abnormalities of sympathetic innervation in the area of an injured peripheral nerve in a rat model of neuropathic pain. *Neurosci Lett* 162 (1-2):85-8.
- Clark AK, D'Aquisto F, Gentry C, Marchand F, McMahon SB, Malcangio M. 2006. Rapid co-release of interleukin 1beta and caspase 1 in spinal cord inflammation. *J Neurochem* 99 (3):868-80.
- Clark AK, Wodarski R, Guida F, Sasso O, Malcangio M. 2010. Cathepsin S release from primary cultured microglia is regulated by the P2X7 receptor. *Glia* 58 (14):1710-26.
- Clark AK, Yip PK, Malcangio M. 2009. The liberation of fractalkine in the dorsal horn requires microglial cathepsin S. *J Neurosci* 29 (21):6945-54.
- Coderre TJ, Katz J Vaccarino AL, Melzack R. 1993. Contribution of central neuroplasticity to pathological pain: review of clinical and experimental evidence. *Pain* 52 (3):259-85.
- Coderre TJ, Vaccarino AL, Melzack R. 1990. Central nervous system plasticity in the tonic pain response to subcutaneous formalin injection. *Brain Res* 535 (1):155-8.
- Coderre TJ, Wall PD. 1987. Ankle joint urate arthritis (AJUA) in rats: an alternative animal model of arthritis to that produced by Freund's adjuvant. *Pain* 28 (3):379-93.
- Colburn RW, DeLeo JA. 1999. The effect of perineural colchicine on nerve injury-induced spinal glial activation and neuropathic pain behavior. *Brain Res Bull* 49 (6):419-27.

- Collier HO, Dinneen LC, Johnson CA, Schneider C. 1968. The abdominal constriction response and its suppression by analgesic drugs in the mouse. *Br J Pharmacol Chemother* 32 (2):295-310.
- Combe R, Bramwell S, Field MJ. 2004. The monosodium iodoacetate model of osteoarthritis: a model of chronic nociceptive pain in rats? *Neurosci Lett* 370 (2-3):236-40.
- Coull JA, Boudreau D, Bachand K, Prescott SA, Nault F, Sik A, De Koninck P, De Koninck Y. 2003. Trans-synaptic shift in anion gradient in spinal lamina I neurons as a mechanism of neuropathic pain. *Nature* 424 (6951):938-42.
- Coull JA, Beggs S, Boudreau D, Boivin D, Tsuda M, Inoue K, Gravel C, Salter MW, De Koninck Y. 2005. BDNF from microglia causes the shift in neuronal anion gradient underlying neuropathic pain. *Nature* 438 (7070):1017-21.
- Courteix C, Bardin M, Chantelauze C, Lavarenne J, Eschalier A. 1994. Study of the sensitivity of the diabetes-induced pain model in rats to a range of analgesics. *Pain* 57 (2):153-60.
- Courteix C, Bourget P, Caussade F, Bardin M, Coudore F, Fialip J, Eschalier A. 1998. Is the reduced efficacy of morphine in diabetic rats caused by alterations of opiate receptors or of morphine pharmacokinetics? *J Pharmacol Exp Ther* 285 (1):63-70.
- Courteix C, Eschalier A, Lavarenne J. 1993. Streptozocin-induced diabetic rats: behavioural evidence for a model of chronic pain. *Pain* 53 (1):81-8.
- Cowan, A. 1990. *Recent approaches in the testing of analgesics in animals. In: Modern Methods in Pharmacology.* 6 vols. Vol. Testing and evaluation of Drugs of Abuse. : Wiley-Liss, Inc.
- Creamer P, Hochberg MC. 1997. Osteoarthritis. *Lancet* 350 (9076):503-8.
- Cui JG, Holmin S, Mathiesen T, Meyerson BA, Linderoth B. 2000. Possible role of inflammatory mediators in tactile hypersensitivity in rat models of mononeuropathy. *Pain* 88 (3):239-48.
- D'Amour FE, Smith DL. 1941. A method for determining loss of pain sensation. *J Pharmacol Exp Ther* 72 (74).
- Dalal A, Tata M, Allegre G, Gekiere F, Bons N, Albe-Fessard D. 1999. Spontaneous activity of rat dorsal horn cells in spinal segments of sciatic projection following transection of sciatic nerve or of corresponding dorsal roots. *Neuroscience* 94 (1):217-28.
- Dallel R, Raboisson P, Clavelou P, Saade M, Woda A. 1995. Evidence for a peripheral origin of the tonic nociceptive response to subcutaneous formalin. *Pain* 61 (1):11-6.
- Dandekar DS, Lokeshwar VB, Cevallos-Arellano E, Soloway MS, Lokeshwar BL. 2003. An orally active Amazonian plant extract (BIRM) inhibits prostate cancer growth and metastasis. *Cancer Chemother Pharmacol* 52 (1):59-66.
- Daulhac L, Mallet C, Courteix C, Etienne M, Duroux E, Privat AM, Eschalier A, Fialip J. 2006. Diabetes-induced mechanical hyperalgesia involves spinal mitogen-activated protein kinase activation in neurons and microglia via N-methyl-D-aspartate-dependent mechanisms. *Mol Pharmacol* 70 (4):1246-54.
- Dayer JM, de Rochemonteix B, Burrus B, Demczuk S, Dinarello CA. 1986. Human recombinant interleukin 1 stimulates collagenase and prostaglandin E2 production by human synovial cells. *J Clin Invest* 77 (2):645-8.

- De Castro costa M, De Sutter P, Gybels J, Van Hees J 1981. Adjuvant induced arthritis in rats: A possible animal model of chronic pain. . *Pain* 10:173-186.
- De Vry J, Kuhl E, Franken-Kunkel P, Eckel G. 2004. Pharmacological characterization of the chronic constriction injury model of neuropathic pain. *Eur J Pharmacol* 491 (2-3):137-48.
- Decosterd I, Woolf CJ. 2000. Spared nerve injury: an animal model of persistent peripheral neuropathic pain. *Pain* 87 (2):149-58.
- DeLeo JA, Coombs DW, Willenbring S, Colburn RW, Fromm C, Wagner R, Twitchell BB. 1994. Characterization of a neuropathic pain model: sciatic cryoneurolysis in the rat. *Pain* 56 (1):9-16.
- DeLeo JA, Colburn RW, Nichols M, Malhotra A. 1996. Interleukin-6-mediated hyperalgesia/allodynia and increased spinal IL-6 expression in a rat mononeuropathy model. *J Interferon Cytokine Res* 16 (9):695-700.
- DeLeo JA, Yeziarski RP. 2001. The role of neuroinflammation and neuroimmune activation in persistent pain. *Pain* 90 (1-2):1-6.
- . 2001. The role of neuroinflammation and neuroimmune activation in persistent pain. *Pain* 90 (1-2):1-6.
- Dennis S, Melzack R. 1983. *Perspective on phylogenetic evolution of pain expression*. Edited by K. R. L. a. E. H.H., *Animal pain: Perception and Alleviation* Bethesda, Maryland: American Physiological Society.
- Derardt R, Jougney S, Delevalcee F, Falhout M 1980. Release of Prostaglandins E and F in Algogenic Reaction and its Inhibition. *Eur. J. Pharmacol* (51):17-24.
- Devor M, Janig W, Michaelis M. 1994. Modulation of activity in dorsal root ganglion neurons by sympathetic activation in nerve-injured rats. *J Neurophysiol* 71 (1):38-47.
- Devor M, Keller CH, Deerinck TJ, Levinson SR, Ellisman MH. 1989. Na<sup>+</sup> channel accumulation on axolemma of afferent endings in nerve end neuromas in *Apterionotus*. *Neurosci Lett* 102 (2-3):149-54.
- Devor M, Schonfeld D, Seltzer Z, Wall PD. 1979. Two modes of cutaneous reinnervation following peripheral nerve injury. *J Comp Neurol* 185 (1):211-20.
- Devor M, Wall PD. 1976. Type of sensory nerve fibre sprouting to form a neuroma. *Nature* 262 (5570):705-8.
- Diamond J, Holmes M, Coughlin M. 1992. Endogenous NGF and nerve impulses regulate the collateral sprouting of sensory axons in the skin of the adult rat. *J Neurosci* 12 (4):1454-66.
- Dickenson AH, Sullivan AF. 1987. Subcutaneous formalin-induced activity of dorsal horn neurones in the rat: differential response to an intrathecal opiate administered pre or post formalin. *Pain* 30 (3):349-60.
- Dirig DM, Isakson PC, Yaksh TL. 1998. Effect of COX-1 and COX-2 inhibition on induction and maintenance of carrageenan-evoked thermal hyperalgesia in rats. *J Pharmacol Exp Ther* 285 (3):1031-8.

- do Amaral JF, Silva MI, Neto MR, Neto PF, Moura BA, de Melo CT, de Araujo FL, de Sousa DP, de Vasconcelos PF, de Vasconcelos SM, de Sousa FC. 2007. Antinociceptive effect of the monoterpene R-(+)-limonene in mice. *Biol Pharm Bull* 30 (7):1217-20.
- Dong Y, Benveniste EN. 2001. Immune function of astrocytes. *Glia* 36 (2):180-90.
- Dougherty PM, Sluka KA, Sorkin LS, Westlund KN, Willis WD. 1992. Neural changes in acute arthritis in monkeys. I. Parallel enhancement of responses of spinothalamic tract neurons to mechanical stimulation and excitatory amino acids. *Brain Res Brain Res Rev* 17 (1):1-13.
- Dray, A. 1995. Inflammatory mediators of pain. *Br J Anaesth* 75 (2):125-31.
- . 2008. Neuropathic pain: emerging treatments. *Br J Anaesth* 101 (1):48-58.
- Dubin AE, Patapoutian A. 2010. Nociceptors: the sensors of the pain pathway. *J Clin Invest* 120 (11):3760-72.
- Dubner, R. 1991. *Neuronal plasticity in the spinal and medullary dorsal horns: a possible role in central pain mechanisms.* . Edited by C. K.L., *Pain and Central Nervous Disease: The Central Pain Syndromes.* New York: Raven Press.
- Dubuisson D, Dennis SG. 1977. The formalin test: a quantitative study of the analgesic effects of morphine, meperidine, and brain stem stimulation in rats and cats. *Pain* 4 (2):161-74.
- Durrenberger PF, Facer P, Casula MA, Yiangou Y, Gray RA, Chessell IP, Day NC, Collins SD, Bingham S, Wilson AW, Elliot D, Birch R, Anand P. 2006. Prostanoid receptor EP1 and Cox-2 in injured human nerves and a rat model of nerve injury: a time-course study. *BMC Neurol* 6:1.
- Dworkin, RH. 2002. An overview of neuropathic pain: syndromes, symptoms, signs, and several mechanisms. *Clin J Pain* 18 (6):343-9.
- Dyck P, Kratz KM, Karnes JL, Litchy WJ, Klein R, Pach JM, Wilson DM, O'Brien PC, Melton LJ, Service FJ. 1993. The prevalence by staged severity of various types of diabetic neuropathy, retinopathy, and nephropathy in a population-based cohort: the Rochester Diabetic Neuropathy Study. *Neurology* 43 (4):817-24.
- Eaton, M. 2003. Common animal models for spasticity and pain. *J Rehabil Res Dev* 40 (4 Suppl 1):41-54.
- Eddy NB, Leimbach D. 1953. Synthetic analgesics. II. Dithienylbutenyl- and dithienylbutylamines. *J Pharmacol Exp Ther* 107 (3):385-93.
- Eliav E, Herzberg U, Ruda MA, Bennett GJ. 1999. Neuropathic pain from an experimental neuritis of the rat sciatic nerve. *Pain* 83 (2):169-82.
- Ellis A, Bennett DL. 2013. Neuroinflammation and the generation of neuropathic pain. *Br J Anaesth* 111 (1):26-37.
- Ellis A, Benson N, Machin I, Corradini L. 2008. *The rat formalin test: Can it predict neuropathic pain treatments?* . Edited by e. a. . Eds Spink A.J. Vol. Proceedings of Measuring Behavior.
- Enohumah KO, Imarengiave CO. 2008. Pain in Osteoarthritis. *African Journal of Biomedical Research* 11:119-128.

- Eriksson NP, Persson JKE, Svensson N, Arvidsson J, Molander C. 1993. A quantitative analysis of the microglial cell reaction in central primary sensory projection territories following peripheral nerve injury in the adult rat. . *Experimental Brain Research* 96:19-27.
- Fairbanks CA, Schreiber KL, Brewer KL, Yu CG, Stone LS, Kitto KF, Nguyen HO, Grocholski BM, Shoeman DW, Kehl LJ, Regunathan S, Reis DJ, Yeziarski RP, Wilcox G. 2000. Agmatine reverses pain induced by inflammation, neuropathy, and spinal cord injury. *Proc Natl Acad Sci U S A* 97 (19):10584-9.
- Fein, A. 2012. *Processing of Nociceptor signals in the spinal cord Nociceptor and the Perception of Pain.*
- Ferrari D, Chiozzi P, Falzoni S, Hanau S, Di Virgilio F. 1997. Purinergic modulation of interleukin-1 beta release from microglial cells stimulated with bacterial endotoxin. *J Exp Med* 185 (3):579-82.
- Ferreira-Gomes J, Adaes S, Castro-Lopes JM. 2008. Assessment of movement-evoked pain in osteoarthritis by the knee-bend and CatWalk tests: a clinically relevant study. *J Pain* 9 (10):945-54.
- Fiorucci S, Antonelli E, Burgaud JL, Morelli A. 2001. Nitric oxide-releasing NSAIDs: a review of their current status. *Drug Saf* 24 (11):801-11.
- Fleetwood-Walker SM, Quinn JP, Wallace C, Blackburn-Munro G, Kelly BG, Fiskerstrand CE, Nash AA, Dalziel RG. 1999. Behavioural changes in the rat following infection with varicella-zoster virus. *J Gen Virol* 80 ( Pt 9):2433-6.
- Fonnum F, Johnsen A, Hassel B. 1997. Use of fluorocitrate and fluoroacetate in the study of brain metabolism. *Glia* 21 (1):106-13.
- Forman LJ, Estilow S, Lewis M, Vasilenko P. 1986. Streptozocin diabetes alters immunoreactive beta-endorphin levels and pain perception after 8 wk in female rats. *Diabetes* 35 (12):1309-13.
- Franklin KB, Abbott FV. 1993. Pentobarbital, diazepam, and ethanol abolish the interphase diminution of pain in the formalin test: evidence for pain modulation by GABAA receptors. *Pharmacol Biochem Behav* 46 (3):661-6.
- Freshwater JD, Svensson CI, Malmberg AB, Calcutt NA. 2002. Elevated spinal cyclooxygenase and prostaglandin release during hyperalgesia in diabetic rats. *Diabetes* 51 (7):2249-55.
- Frommann, C. 1878. Untersuchungen über die Gewebsveränderungen bei der Multiplen Sklerose des Gehirns und Rückenmrks. . *Verlag von Gustav Fischer.*
- Fukuoka H, Kawatani M, Hisamitsu T, Takeshige C. 1994. Cutaneous hyperalgesia induced by peripheral injection of interleukin-1 beta in the rat. *Brain Res* 657 (1-2):133-40.
- Galan A, Laird JM, Cervero F. 2004. In vivo recruitment by painful stimuli of AMPA receptor subunits to the plasma membrane of spinal cord neurons. *Pain* 112 (3):315-23.
- Gao YJ, Ji RR. 2010. Chemokines, neuronal-glia interactions, and central processing of neuropathic pain. *Pharmacol Ther* 126 (1):56-68.

- Garrison, C. J., P. M. Dougherty, K. C. Kajander, and S. M. Carlton. 1991. Staining of glial fibrillary acidic protein (GFAP) in lumbar spinal cord increases following a sciatic nerve constriction injury. *Brain Res* 565 (1):1-7.
- Garrison CJ, Dougherty PM, Carlton SM. 1994. GFAP expression in lumbar spinal cord of naive and neuropathic rats treated with MK-801. *Exp Neurol* 129 (2):237-43.
- George A, Schmidt C, Weishaupt A, Toyka KV, Sommer C. 1999. Serial determination of tumor necrosis factor-alpha content in rat sciatic nerve after chronic constriction injury. *Exp Neurol* 160 (1):124-32.
- Giri JG, Lomedico PT, Mizel SB. 1985. Studies on the synthesis and secretion of interleukin 1. I. A 33,000 molecular weight precursor for interleukin 1. *J Immunol* 134 (1):343-9.
- Giuliano F, Warner TD. 2002. Origins of prostaglandin E2: involvements of cyclooxygenase (COX)-1 and COX-2 in human and rat systems. *J Pharmacol Exp Ther* 303 (3):1001-6.
- Gold M, Gebhart G. 2010. *Peripheral pain mechanisms and nociceptor sensitization*. . Edited by B. J. Fishman S, Rathmell JP. 4th ed, *Bonica's Pain Management*: Lippincott Williams & Wilkins (LWW).
- Gracely RH, Lynch SA, Bennett GJ. 1992. Painful neuropathy: altered central processing maintained dynamically by peripheral input. *Pain* 51 (2):175-94.
- Graeber MB, Christie MJ. 2012. Multiple mechanisms of microglia: a gatekeeper's contribution to pain states. *Exp Neurol* 234 (2):255-61.
- Green AF, Young PA. 1951. A comparison of heat and pressure analgesiometric methods in rats. *Br J Pharmacol Chemother* 6 (4):572-85.
- Greenacre S, Ridger V, Wilsoncroft P, Brain SD. 1997. Peroxynitrite: a mediator of increased microvascular permeability? *Clin Exp Pharmacol Physiol* 24 (11):880-2.
- Guasti L, Richardson D, Jhaveri M, Eldeeb K, Barrett D, Elphick MR, Alexander SP, Kendall D, Michael GJ, Chapman V. 2009. Minocycline treatment inhibits microglial activation and alters spinal levels of endocannabinoids in a rat model of neuropathic pain. *Mol Pain* 5:35.
- Guay J, Bateman K, Gordon R, Mancini J, Riendeau D. 2004. Carrageenan-induced paw edema in rat elicits a predominant prostaglandin E2 (PGE2) response in the central nervous system associated with the induction of microsomal PGE2 synthase-1. *J Biol Chem* 279 (23):24866-72.
- Guingamp C, Gegout-Pottie P , Philippe L, Terlain B, Netter P, Gillet P. 1997. Mono-iodoacetate-induced experimental osteoarthritis: a dose-response study of loss of mobility, morphology, and biochemistry. *Arthritis Rheum* 40 (9):1670-9.
- Guzman RE, Evans MG, Bove S, Morenko B, Kilgore K. 2003. Mono-iodoacetate-induced histologic changes in subchondral bone and articular cartilage of rat femorotibial joints: an animal model of osteoarthritis. *Toxicol Pathol* 31 (6):619-24.
- Gwilym, SE, Pollard TC, Carr AJ. 2008. Understanding pain in osteoarthritis. *J Bone Joint Surg Br* 90 (3):280-7.
- Haffner, F. 1929. Experimentelle prufung schmerzstellender mittel. *Dtsch Med Wschr* (55):731-733.

- Hainline, B. 2005. Chronic pain: physiological, diagnostic, and management considerations. *Psychiatr Clin North Am* 28 (3):713-35, 731.
- Hains BC, Waxman SG. 2006. Activated microglia contribute to the maintenance of chronic pain after spinal cord injury. *J Neurosci* 26 (16):4308-17.
- Hamilton TA, Ohmori Y, Tebo JM, Kishore R. 1999. Regulation of macrophage gene expression by pro- and anti-inflammatory cytokines. *Pathobiology* 67 (5-6):241-4.
- Hansson P, Lacerenza M, Marchettini P. 2001. *Aspects of clinical and experimental neuropathic pain: the clinical perspective*. . Edited by F. H. Hansson P, Hill R.G., Marchettini P.,. Vol. 21, *Neuropathic pain: pathophysiology and treatment* Seattle: IASP Press.
- Hao JX, Xu XJ, Aldskogius H, Seiger A, Wiesenfeld-Hallin Z. 1991. Allodynia-like effects in rat after ischaemic spinal cord injury photochemically induced by laser irradiation. *Pain* 45 (2):175-85.
- Hargreaves K, Dubner R, Brown F, Flores C, Joris, J. 1988. A new and sensitive method for measuring thermal nociception in cutaneous hyperalgesia. *Pain* 32 (1):77-88.
- Hart RP, Shadiack AM, Jonakait GM. 1991. Substance P gene expression is regulated by interleukin-1 in cultured sympathetic ganglia. *J Neurosci Res* 29 (3):282-91.
- Harvey RJ, Depner UB, Wassle H, Ahmadi S, Heindl C, Reinold H, Smart TG, Harvey K, Schutz B, Abo-Salem OM, Zimmer A, Poisbeau P, Welzl H, Wolfer DP, Betz H, Zeilhofer HU, Muller U. 2004. GlyR alpha3: an essential target for spinal PGE2-mediated inflammatory pain sensitization. *Science* 304 (5672):884-7.
- Harvey VL, Discenson AH. 2009. Behavioral and electrophysiological characterization of experimentally induced osteoarthritis and neuropathy in C57BL/6 mice. . *Molecular Pain* 5:18-.
- Hashizum H, Rutkowski MD, Weinstein JN, DeLeo JA. 2000. Central administration of methotrexate reduces mechanical allodynia in an animal model of radiculopathy/sciatica. *Pain* 87 (2):159-69.
- Hayes GM, Woodroffe MN, Cuzner ML. 1987. Microglia are the major cell type expressing MHC class II in human white matter. *J Neurol Sci* 80 (1):25-37.
- Haywood L, McWilliams DF, Pearson CI, Gill SE, Ganesan A, Wilson D, Walsh DA. 2003. Inflammation and angiogenesis in osteoarthritis. *Arthritis Rheum* 48 (8):2173-7.
- Heapy CG, Jamieson A, Russell NJW. 1987. . Afferent C-fibre and A-delta activity in models of inflammation. . *Br J Pharmacol* 90 (164).
- Hefferan MP, O'Rielly DD, Loomis CW. 2003. Inhibition of spinal prostaglandin synthesis early after L5/L6 nerve ligation prevents the development of prostaglandin-dependent and prostaglandin-independent allodynia in the rat. *Anesthesiology* 99 (5):1180-8.
- Hendershot LC, Forsaith J. 1959. Antagonism of the frequency of phenylquinone-induced writhing in the mouse by weak analgesics and nonanalgesics. *J Pharmacol Exp Ther* 125 (3):237-40.
- Hendiani JA, Westlund KN, Lawand N, Goel N, Lisse J, McNearney T. 2003. Mechanical sensation and pain thresholds in patients with chronic arthropathies. *J Pain* 4 (4):203-11.

- Henriques MG, Silva PM., Martins MA, Flores CA, Cunha FQ, Assreuy-Filho J, Cordeiro RS. 1987. Mouse paw edema. A new model for inflammation? *Braz J Med Biol Res* 20 (2):243-9.
- Henry. 2008. *Pathophysiology of chronic pain Chronic Pain: a health policy perspective*. Weinheim, Germany: Wiley Blackwell.
- Henry JL, Yashpal K, Pitcher GM,Coderre TJ. 1999. Physiological evidence that the 'interphase' in the formalin test is due to active inhibition. *Pain* 82 (1):57-63.
- Heppelmann, B. 1997. Anatomy and histology of joint innervation. *J Peripher Nerv Syst* 2 (1):5-16.
- Heughan CE, Sawynok J. 2002. The interaction between gabapentin and amitriptyline in the rat formalin test after systemic administration. *Anesth Analg* 94 (4):975-80, table of contents.
- Hoheisel U, Koch K, Mense S. 1994. Functional reorganization in the rat dorsal horn during an experimental myositis. *Pain* 59 (1):111-8.
- Holderbaum D, Haqqi TM, Moskowitz RW. 1999. Genetics and osteoarthritis: exposing the iceberg. *Arthritis Rheum* 42 (3):397-405.
- Hou L, Li W, Wang X. 2003. Mechanism of interleukin-1 beta-induced calcitonin gene-related peptide production from dorsal root ganglion neurons of neonatal rats. *J Neurosci Res* 73 (2):188-97.
- Huang YY, Colino A, Selig DK, Malenka RC. 1992. The influence of prior synaptic activity on the induction of long-term potentiation. *Science* 255 (5045):730-3.
- Hung J, Chansard M, Ousman SS, Nguyen MD, Colicos MA. 2009. Activation of microglia by neuronal activity: results from a new in vitro paradigm based on neuronal-silicon interfacing technology. *Brain Behav Immun* 24 (1):31-40.
- Hunskar S, Berge OG, Hole K. 1986. Dissociation between antinociceptive and anti-inflammatory effects of acetylsalicylic acid and indomethacin in the formalin test. *Pain* 25 (1):125-32.
- Hunskar S, Fasmer OB, Hole K. 1985. Formalin test in mice, a useful technique for evaluating mild analgesics. *J Neurosci Methods* 14 (1):69-76.
- Hunskar S, Hole K. 1987. The formalin test in mice: dissociation between inflammatory and non-inflammatory pain. *Pain* 30 (1):103-14.
- Hunter JC, Gogas KR, Hedley LR, Jacobson LO, Kassotakis L, Thompson J, Fontana DJ. 1997. The effect of novel anti-epileptic drugs in rat experimental models of acute and chronic pain. *Eur J Pharmacol* 324 (2-3):153-60.
- Hutchinson MR, Bland ST, Johnson KW, Rice KC, Maier SF, Watkins LR. 2007. Opioid-induced glial activation: mechanisms of activation and implications for opioid analgesia, dependence, and reward. *ScientificWorldJournal* 7:98-111.
- Iadarola MJ, Brady LS, Draisci G, Dubner R. 1988. Enhancement of dynorphin gene expression in spinal cord following experimental inflammation: stimulus specificity, behavioral parameters and opioid receptor binding. *Pain* 35 (3):313-26.

- Ibuki T, Matsumura K, Yamazaki Y, Nozaki T, Tanaka Y, Kobayashi S. 2003. Cyclooxygenase-2 is induced in the endothelial cells throughout the central nervous system during carrageenan-induced hind paw inflammation; its possible role in hyperalgesia. *J Neurochem* 86 (2):318-28.
- Ichitami Y, Shi T, Haeggstrom JZ, Samuelsson B, Hokfelt T. 1997. Increased levels of cyclooxygenase-2 mRNA in the rat spinal cord after peripheral inflammation: an in situ hybridization study. *Neuroreport* 8 (13):2949-2952.
- Inoue A, Ikoma K, Morioka N, Kumagai K, Hashimoto T, Hide I, Nakata Y. 1999. Interleukin-1beta induces substance P release from primary afferent neurons through the cyclooxygenase-2 system. *J Neurochem* 73 (5):2206-13.
- Inoue K, Tsuda M. 2009. Microglia and neuropathic pain. *Glia* 57 (14):1469-79.
- International Association for the Study of Pain Taxonomy* [cited. Available from [http://www.iasp.pain.org/AM/Template.cfm?Section=Pain\\_Definitions](http://www.iasp.pain.org/AM/Template.cfm?Section=Pain_Definitions)].
- Jaggi R, Wurgler U, Grandjean F, Weiser M. 2004. Dual inhibition of 5-lipoxygenase/cyclooxygenase by a reconstituted homeopathic remedy; possible explanation for clinical efficacy and favourable gastrointestinal tolerability. *Inflamm Res* 53 (4):150-7.
- Janig W, Levine JD, Michaelis M. 1996. Interactions of sympathetic and primary afferent neurons following nerve injury and tissue trauma. *Prog Brain Res* 113:161-84.
- Jean YH, Chen WF, Duh CY, Huang SY, Hsu CH, Lin CS, Sung CS, Chen IM, Wen ZH. 2008. Inducible nitric oxide synthase and cyclooxygenase-2 participate in anti-inflammatory and analgesic effects of the natural marine compound lemnalol from Formosan soft coral *Lemnalina cervicorni*. *Eur J Pharmacol* 578 (2-3):323-31.
- Jean YH, Chen WF, Sung CS, Duh CY, Huang SY, Lin CS, Tai MH, Tzeng SF, Wen ZH. 2009. Capnellene, a natural marine compound derived from soft coral, attenuates chronic constriction injury-induced neuropathic pain in rats. *Br J Pharmacol* 158 (3):713-25.
- Jensen TS, Gottrup H, Sindrup SH, Bach FW. 2001. The clinical picture of neuropathic pain. *Eur J Pharmacol* 429 (1-3):1-11.
- Jensen TS, Lenz FA. 1995. Central post-stroke pain: a challenge for the scientist and the clinician. *Pain* 61 (2):161-4.
- Ji RR, Gereau RW, Malcangio M, Strichartz GR. 2009. MAP kinase and pain. *Brain Res Rev* 60 (1):135-48.
- Ji RR, Kohno T, Moore KA, Woolf CJ. 2003. Central sensitization and LTP: do pain and memory share similar mechanisms? *Trends Neurosci* 26 (12):696-705.
- Ji RR, Suter MR. 2007. p38 MAPK, microglial signaling, and neuropathic pain. *Mol Pain* 3:33.
- Jin X, Gereau RW. 2006. Acute p38-mediated modulation of tetrodotoxin-resistant sodium channels in mouse sensory neurons by tumor necrosis factor-alpha. *J Neurosci* 26 (1):246-55.
- Jung WW, Kim HS, Shon JR, Lee M, Lee SH, Sul D, Na HS, Kim JH, Kim BJ. 2011. Intervertebral disc degeneration-induced expression of pain-related molecules: glial cell-derived neurotrophic factor as a key factor. *J Neurosurg Anesthesiol* 23 (4):329-34.

- Kalso E, Edwards JE, Moore RA, McQuay HJ. 2004. Opioids in chronic non-cancer pain: systematic review of efficacy and safety. *Pain* 112 (3):372-80.
- Kanaan SA, Poole S, Saade NE, Jabbur S, Safieh-Garabedian B. 1998. Interleukin-10 reduces the endotoxin-induced hyperalgesia in mice. *J Neuroimmunol* 86 (2):142-50.
- Kawasaki Y, Zhang L, Cheng JK, Ji, RR. 2008. Cytokine mechanisms of central sensitization: distinct and overlapping role of interleukin-1beta, interleukin-6, and tumor necrosis factor-alpha in regulating synaptic and neuronal activity in the superficial spinal cord. *J Neurosci* 28 (20):5189-94.
- Kehlet H, Jensen TS, Woolf CJ. 2006. Persistent postsurgical pain: risk factors and prevention. *Lancet* 367 (9522):1618-25.
- Keizer, D. 2009. Epidemiology, clinical features and diagnosis of neuropathic pain.
- Keller AF, Beggs S, Salter MW, De Koninck Y. 2007. Transformation of the output of spinal lamina I neurons after nerve injury and microglia stimulation underlying neuropathic pain. *Mol Pain* 3:27.
- Kettenmann H, Hanisch UK, Noda M, Verkhratsky A. 2011. Physiology of microglia. *Physiol Rev* 91 (2):461-553.
- Kidd BL, Urban LA. 2001. Mechanisms of inflammatory pain. *Br J Anaesth* 87 (1):3-11.
- Kim SH, Chung JM. 1992. An experimental model for peripheral neuropathy produced by segmental spinal nerve ligation in the rat. *Pain* 50 (3):355-63.
- Kim SH, Kwon JK, Kwon YB. 2012. Pain modality and spinal glia expression by streptozotocin induced diabetic peripheral neuropathy in rats. *Lab Anim Res* 28 (2):131-6.
- Kingery WS, Vallin JA. 1989. The development of chronic mechanical hyperalgesia, autotomy and collateral sprouting following sciatic nerve section in rat. *Pain* 38 (3):321-32.
- Kleinschnitz C, Brinkhoff J, Zelenka M, Sommer C, Stoll G. 2004. The extent of cytokine induction in peripheral nerve lesions depends on the mode of injury and NMDA receptor signaling. *J Neuroimmunol* 149 (1-2):77-83.
- Koster R, Anderson M, de Beer EJ. 1959. Acetic acid for analgesic screening. *Fed. Proc.* 18:418-420.
- Kumar A, Meena S, Pottabathini R. 2014. Effect of Ashwagandha (*Withania somnifera*) against chronic constriction injury induced behavioral and biochemical alterations: possible involvement of nitric oxide mechanism. *International Journal of Nutrition, Pharmacology, Neurological Diseases* 4 (3):131-138.
- Kyranou M, Puntillo K. 2012. The transition from acute to chronic pain: might intensive care unit patients be at risk? *Ann Intensive Care* 2 (1):36.
- Lampropoulou-Adamidou K, Lelovas P, Karadimas EV, Liakou C, Triantafillopoulos IK, Dontas I, Papaioannou NA. 2013. Useful animal models for the research of osteoarthritis. *Eur J Orthop Surg Traumatol* 24 (3):263-71.
- Lariviere WR, Sattar MA, Melzack R. 2006. Inflammation-susceptible Lewis rats show less sensitivity than resistant Fischer rats in the formalin inflammatory pain test and with repeated thermal testing. *J Neurophysiol* 95 (5):2889-97.

- Larson AA, Wilcox GL. 1984. Synergistic behavioral effects of serotonin and tryptamine injected intrathecally in mice. *Neuropharmacology* 23 (12A):1415-8.
- Le Bars D, Gozariu M, Cadden SW. 2001. Animal models of nociception. *Pharmacol Rev* 53 (4):597-652.
- Ledeboer A, Jekich BM, Sloane EM, Mahoney JH, Langer SJ, Milligan ED, Martin D, Maier SF, Johnson KW, Leinwand LA, Chavez RA, Watkins LR. 2007. Intrathecal interleukin-10 gene therapy attenuates paclitaxel-induced mechanical allodynia and proinflammatory cytokine expression in dorsal root ganglia in rats. *Brain Behav Immun* 21 (5):686-98.
- Ledeboer A, Sloane EM, Milligan ED, Frank MG, Mahony JH, Maier SF, Watkins LR. 2005. Minocycline attenuates mechanical allodynia and proinflammatory cytokine expression in rat models of pain facilitation. *Pain* 115 (1-2):71-83.
- Lee BH, Won R, Baik EJ, Lee SH, Moon CH. 2000. An animal model of neuropathic pain employing injury to the sciatic nerve branches. *Neuroreport* 11 (4):657-61.
- Lee IO, Kong MH, Kim NS, Choi YS, Lim SH, Lee MK. 2000. Effects of different concentrations and volumes of formalin on pain response in rats. *Acta Anaesthesiol Sin* 38 (2):59-64.
- Lee JH, Cox DJ, Mook DG, McCarty RC. 1990. Effect of hyperglycemia on pain threshold in alloxan-diabetic rats. *Pain* 40 (1):105-7.
- Leem JG, Bove GM. 2002. Mid-axonal tumor necrosis factor-alpha induces ectopic activity in a subset of slowly conducting cutaneous and deep afferent neurons. *J Pain* 3 (1):45-9.
- Lindblom, U. 1994. *Analysis of abnormal touch, pain and temperature sensation in patients*. . Edited by H. P. Boivie J., Lindblom U. Vol. 3, *Touch, Temperature and Pain in Health and Disease: Mechanisms and Assessment, Progress in Pain Research and Management*. Seattle: IASP Press.
- Lindenlaub T, Teuteberg P, Hartung T, Sommer C. 2000. Effects of neutralizing antibodies to TNF-alpha on pain-related behavior and nerve regeneration in mice with chronic constriction injury. *Brain Res* 866 (1-2):15-22.
- Linley JE, Rose K, Ooi L, Gamper N. 2010. Understanding inflammatory pain: ion channels contributing to acute and chronic nociception. *Pflugers Arch* 459 (5):657-69.
- Little CB, Zaki S. 2012. What constitutes an "animal model of osteoarthritis"--the need for consensus? *Osteoarthritis Cartilage* 20 (4):261-7.
- Liu CN, Michaelis M, Amir R, Devor M. 2000. Spinal nerve injury enhances subthreshold membrane potential oscillations in DRG neurons: relation to neuropathic pain. *J Neurophysiol* 84 (1):205-15.
- Ma L, Pei G. 2007. Beta-arrestin signaling and regulation of transcription. *J Cell Sci* 120 (Pt 2):213-8.
- Ma QP, Woolf CJ. 1995. Noxious stimuli induce an N-methyl-D-aspartate receptor-dependent hypersensitivity of the flexion withdrawal reflex to touch: implications for the treatment of mechanical allodynia. *Pain* 61 (3):383-90.

- Ma W, Eisenach JC. 2003. Cyclooxygenase 2 in infiltrating inflammatory cells in injured nerve is universally up-regulated following various types of peripheral nerve injury. *Neuroscience* 121 (3):691-704.
- Mach DB, Rogers SD, Sabino MC, Luger NM, Schwei MJ, Pomonis JD, Keyser CP, Clohisy DR, Adams DJ, O'Leary P, Mantyh PW. 2002. Origins of skeletal pain: sensory and sympathetic innervation of the mouse femur. *Neuroscience* 113:155-156.
- MacKenzie A, Wilson HL, Kiss-Toth E, Dower SK, North RA, Surprenant A. 2001. Rapid secretion of interleukin-1beta by microvesicle shedding. *Immunity* 15 (5):825-35.
- Magerl W, Fuchs PN, Meyer RA, Treede RD. 2001. Roles of capsaicin-insensitive nociceptors in cutaneous pain and secondary hyperalgesia. *Brain* 124 (Pt 9):1754-64.
- Malan TP, Mata HP, Porreca F. 2002. Spinal GABA(A) and GABA(B) receptor pharmacology in a rat model of neuropathic pain. *Anesthesiology* 96 (5):1161-7.
- Malcangio M, Bowery NG, Flower RJ, Perretti M. 1996. Effect of interleukin-1 beta on the release of substance P from rat isolated spinal cord. *Eur J Pharmacol* 299 (1-3):113-8.
- Malmberg AB, Yaksh TL. 1992. Antinociceptive actions of spinal nonsteroidal anti-inflammatory agents on the formalin test in the rat. *J Pharmacol Exp Ther* 263 (1):136-46.
- Manning, DC 2006. The role of neuroimmune activation in chronic neuropathic pain and new targets for therapeutic intervention. *Emerging strategies for the treatment of neuropathic pain* 161-192.
- Mantyh PW, Clohisy DR, Koltzenburg M, Hunt SP. 2002. Molecular mechanisms of cancer pain. *Nat Rev Cancer* 2 (3):201-9.
- Marchand F, Perretti M, McMahon SB. 2005. Role of the immune system in chronic pain. *Nat Rev Neurosci* 6 (7):521-32.
- Marker CL, Pomonis JD. 2012. The monosodium iodoacetate model of osteoarthritis pain in the rat. *Methods Mol Biol* 851:239-48.
- Marshall KW, Chan AD. 1996. Arthroscopic anterior cruciate ligament transection induces canine osteoarthritis. *J Rheumatol* 23 (2):338-43.
- Martini, R. 2000. Animal models for inherited peripheral neuropathies: chances to find treatment strategies? *J Neurosci Res* 61 (3):244-50.
- Matsunaga A, Kawamoto M, Shiraishi S, Yasuda T, Kajiyama S, Kurita S, Yuge O. 2007. Intrathecally administered COX-2 but not COX-1 or COX-3 inhibitors attenuate streptozotocin-induced mechanical hyperalgesia in rats. *Eur J Pharmacol* 554 (1):12-7.
- Matzner O, Devor M. 1994. Hyperexcitability at sites of nerve injury depends on voltage-sensitive Na<sup>+</sup> channels. *J Neurophysiol* 72 (1):349-59.
- Maves TJ, Pechman PS, Gebhart GF, Meller ST. 1993. Possible chemical contribution from chronic gut sutures produces disorders of pain sensation like those seen in man. *Pain* 54 (1):57-69.
- Mayer ML, Westbrook GL, Guthrie PB. 1984. Voltage-dependent block by Mg<sup>2+</sup> of NMDA responses in spinal cord neurones. *Nature* 309 (5965):261-3.

- McCarberg BH, Billington R. 2006. Consequences of neuropathic pain: quality-of-life issues and associated costs. *Am J Manag Care* 12 (9 Suppl):S263-8.
- McMahon SB, Bennet DLH, Bevan S. 2006. *New pain treatments in late development Wall and Malzack's textbook of pain.*
- McMahon SB, Malcangio M. 2009. Current challenges in glia-pain biology. *Neuron* 64 (1):46-54.
- Meller ST, Gebhart GF. 1997. Intraplantar zymosan as a reliable, quantifiable model of thermal and mechanical hyperalgesia in the rat. *Eur J Pain* 1 (1):43-52.
- Melzack R, Wall PD. 1965. Pain mechanisms: a new theory. *Science* 150 (3699):971-9.
- Mendell, LM. 1966. Physiological properties of unmyelinated fiber projection to the spinal cord. *Exp Neurol* 16 (3):316-32.
- Mendell LM, Wall PD. 1965. Responses of Single Dorsal Cord Cells to Peripheral Cutaneous Unmyelinated Fibres. *Nature* 206:97-9.
- Mense, S. 1991. Considerations concerning the neurobiological basis of muscle pain. *Can J Physiol Pharmacol* 69 (5):610-6.
- . 1993. Nociception from skeletal muscle in relation to clinical muscle pain. *Pain* 54 (3):241-89.
- Mercadante, S. 1997. Malignant bone pain: pathophysiology and treatment. *Pain* 69 (1-2):1-18.
- Meyerovitch J, Rothenberg P, Shechter Y, Bonner-Weir S, Kahn CR. 1991. Vanadate normalizes hyperglycemia in two mouse models of non-insulin-dependent diabetes mellitus. *J Clin Invest* 87 (4):1286-94.
- Mika, J. 2008. Modulation of microglia can attenuate neuropathic pain symptoms and enhance morphine effectiveness. *Pharmacol Rep* 60 (3):297-307.
- Millan, MJ. 1999. The induction of pain: an integrative review. *Prog Neurobiol* 57 (1):1-164.
- Milligan ED, Langer SE, Sloane E, Wieseler-Frank J, Frank M, Levkoff L, Mahoney J, Chavez R, Forsayeth J, Cruz P, flotte TR, Leinwand L, Maier SF, Watkins LR. 2004. Gene therapy using naked plasmid DNA coding the anti-inflammatory gene, interleukin-10 (IL-10): repeated injections lead to long-term pain control in chronic constriction injury (CCI) rats. *The Journal of Pain* 5 (3):S16.
- Milligan ED, Mehmert KK, Hinde JL, Harvey LO, Martin D, Tracey KJ, Maier SF, Watkins LR. 2000. Thermal hyperalgesia and mechanical allodynia produced by intrathecal administration of the human immunodeficiency virus-1 (HIV-1) envelope glycoprotein, gp120. *Brain Res* 861 (1):105-16.
- Milligan ED, O'Connor KA, Nguyen KT, Armstrong CB, Twining C, Gaykema RP, Holguin A, Martin D, Maier SF, Watkins LR. 2001. Intrathecal HIV-1 envelope glycoprotein gp120 induces enhanced pain states mediated by spinal cord proinflammatory cytokines. *J Neurosci* 21 (8):2808-19.
- Milligan ED, Sloane EM, Langer SJ, Cruz PE, Chacur M, Spataro L, Wieseler-Frank J, Hammack SE, Maier SF, Flotte TR, Forsayeth JR, Leinwand LA, Chavez R, Watkins LR. 2005. Controlling neuropathic pain by adeno-associated virus driven production of the anti-inflammatory cytokine, interleukin-10. *Mol Pain* 1:9.

- Milligan ED, Sloane EM, Watkins LR. 2008. Glia in pathological pain: a role for fractalkine. *J Neuroimmunol* 198 (1-2):113-20.
- Milligan ED, Twining C, Chacur M, Biedenkapp J, O'Connor K, Poole S, Tracey K, Martin D, Maier SF, Watkins LR. 2003. Spinal glia and proinflammatory cytokines mediate mirror-image neuropathic pain in rats. *J Neurosci* 23 (3):1026-40.
- Milligan ED, Watkins LR. 2009. Pathological and protective roles of glia in chronic pain. *Nat Rev Neurosci* 10 (1):23-36.
- Miyauchi S, Machida A, Onaya J, Sakamoto T, Tokuyasu K., Iwata H. 1993. Alterations of proteoglycan synthesis in rabbit articular cartilage induced by intra-articular injection of papain. *Osteoarthritis Cartilage* 1 (4):253-62.
- Mizisin AP, Kalichman MW, Myers RR, Powell HC. 1990. Role of the blood-nerve barrier in experimental nerve edema. *Toxicol Pathol* 18 (1 Pt 2):170-85.
- Mizumura, K. 1997. Peripheral mechanism of hyperalgesia--sensitization of nociceptors. *Nagoya J Med Sci* 60 (3-4):69-87.
- Moalem G, Tracey DJ. 2006. Immune and inflammatory mechanisms in neuropathic pain. *Brain Res Rev* 51 (2):240-64.
- Mogil JS, Wilson SG, Wan Y. 2001. *Assessing Nociception in Murine Subjects*. Edited by L. Kruger, *Methods in Pain Research*: CRC Press.
- Moore KW, de Waal Malefyt R, Coffman RL, O'Garra A. 2001. Interleukin-10 and the interleukin-10 receptor. *Annu Rev Immunol* 19:683-765.
- Moore KW, Ho ASY, Xu-Amano J. 1995. *Molecular biology of interleukin-10 and its receptor* Edited by D. J. E. a. d. W. M. E.D, *Interleukin-10*: R.G. lands Company.
- Moore KW, Ho ASY, Xu-Amano J. 1995. *Molecular biology of interleukin-10 and its receptor*. Edited by d. J. a. d. W. M. R., *Interleukin-10*: R.G lands Company.
- Moore KW, O'Garra A, de Waal Malefyt R, Vieira P, Mosmann TR. 1993. Interleukin-10. *Annu Rev Immunol* 11:165-90.
- Morgado C, Pereira-Terra P, Cruz CD, Tavares I. 2011. Minocycline completely reverses mechanical hyperalgesia in diabetic rats through microglia-induced changes in the expression of the potassium chloride co-transporter 2 (KCC2) at the spinal cord. *Diabetes Obes Metab* 13 (2):150-9.
- Morgado C, Terra PP, Tavares I. 2010. Neuronal hyperactivity at the spinal cord and periaqueductal grey during painful diabetic neuropathy: effects of gabapentin. *Eur J Pain* 14 (7):693-9.
- Morris, CJ. 2003. Carrageenan-induced paw edema in the rat and mouse. *Methods Mol Biol* 225:115-21.
- Moskowitz RW, Davis W, Sammarco J, Martens M, Baker J, Mayor M, Burstein AH, Frankel VH. 1973. Experimentally induced degenerative joint lesions following partial meniscectomy in the rabbit. *Arthritis Rheum* 16 (3):397-405.
- Mosseri R, Waner T, Shefi M, Shafrir E, Meyerovitch J. 2000. Gluconeogenesis in non-obese diabetic (NOD) mice: in vivo effects of vandadate treatment on hepatic glucose-6-phosphatase and phosphoenolpyruvate carboxykinase. *Metabolism* 49 (3):321-5.

- Mow VC, Setton LA, Fuilak F, Ratcliffe A. 1995. *Mechanical factors in articular cartilage and their role in osteoarthritis* Edited by G. V. M. Keuttner K.E., *Osteoarthritic Disorders*. Rosemont, IL: American Academy of Orthopaedic Surgeons, Rosemont.
- Murphy PG, Ramer MS, Borthwick L, Gauldie J, Richardson PM, Bisby MA. 1999. Endogenous interleukin-6 contributes to hypersensitivity to cutaneous stimuli and changes in neuropeptides associated with chronic nerve constriction in mice. *Eur J Neurosci* 11 (7):2243-53.
- Na HS, Han JS, Ko KH, Hong SK. 1994. A behavioral model for peripheral neuropathy produced in rat's tail by inferior caudal trunk injury. *Neurosci Lett* 177 (1-2):50-2.
- Nakamura T, Shi D, Tzetis M, Rodriguez-Lopez J, Miyamoto Y, Tsezou A, Gonzalez A, Jiang Q, Kamatani N, Loughlin J, Ikegawa S. 2007. Meta-analysis of association between the ASPN D-repeat and osteoarthritis. *Hum Mol Genet* 16 (14):1676-81.
- Necas J, Bartosikova L. 2013. Carrageenan: a review. *Veterinarni Medicina* 58 (4):187-205.
- Niazi J, Gupta V, Chakarborty P, Kumar P. 2010. Anti-inflammatory and anti-pyretic activity of aleuritis moluccana leaves. *Asian Journal of Pharmaceutical and Clinical Research* 3 (1):35-37.
- Oaklander, AL. 2008. Mechanisms of pain and itch caused by herpes zoster (shingles). *J Pain* 9 (1 Suppl 1):S10-8.
- Obreja O, Rathee PK, Lips KS, Distler C, Kress M. 2002. IL-1 beta potentiates heat-activated currents in rat sensory neurons: involvement of IL-1RI, tyrosine kinase, and protein kinase C. *Faseb J* 16 (12):1497-503.
- Okamoto K, Martin DP, Schmelzer JD, Mitsui Y, Low PA. 2001. Pro-and anti-inflammatory cytokine gene expression in rat sciatic nerve chronic constriction injury model of neuropathic pain. *Exp Neurol* 169:386-391.
- Olsson, Y. 1990. Microenvironment of the peripheral nervous system under normal and pathological conditions. *Crit Rev Neurobiol* 5 (3):265-311.
- Oprea A, Kress M. 2000. Involvement of the proinflammatory cytokines tumor necrosis factor-alpha, IL-1 beta, and IL-6 but not IL-8 in the development of heat hyperalgesia: effects on heat-evoked calcitonin gene-related peptide release from rat skin. *J Neurosci* 20 (16):6289-93.
- O'Rielly DD, Loomis CW. 2006. Increased expression of cyclooxygenase and nitric oxide isoforms, and exaggerated sensitivity to prostaglandin E2, in the rat lumbar spinal cord 3 days after L5-L6 spinal nerve ligation. *Anesthesiology* 104 (2):328-37.
- Owens T, Babcock AA, Millward JM, Toft-Hansen H. 2005. Cytokine and chemokine inter-regulation in the inflamed or injured CNS. *Brain Res Brain Res Rev* 48 (2):178-84.
- Pabbidi RM, Cao DS, Parihar A, Pauza ME, Premkumar LS. 2008. Direct role of streptozotocin in inducing thermal hyperalgesia by enhanced expression of transient receptor potential vanilloid 1 in sensory neurons. *Mol Pharmacol* 73 (3):995-1004.
- Patro N, Nagayach A, Patro IK. 2010. Iba1 expressing microglia in the dorsal root ganglia become activated following peripheral nerve injury in rats. *Indian J Exp Biol* 48 (2):110-6.

- Peters, A. 1964. Further Observations on the Structure of Myelin Sheaths in the Central Nervous System. *J Cell Biol* 20:281-96.
- Platika D, Boulos MH, Baizer L, Fishman MC. 1985. Neuronal traits of clonal cell lines derived by fusion of dorsal root ganglia neurons with neuroblastoma cells. *Proc Natl Acad Sci U S A* 82 (10):3499-503.
- Pond MJ, Nuki G. 1973. Experimentally-induced osteoarthritis in the dog. *Ann Rheum Dis* 32 (4):387-8.
- Poole, AR. 1995. *Imbalances of anabolism and catabolism of cartilage matrix components in osteoarthritis* Edited by G. V. M. Keuttner K.E., *Osteoarthritic Disorders*. Rosemont, IL: American Academy of Orthopaedic Surgeons, Rosemont.
- Posadas I, Bucci M, Roviezzo F, Rossi A, Parente L, Sautebi, L, Cirino G. 2004. Carrageenan-induced mouse paw oedema is biphasic, age-weight dependent and displays differential nitric oxide cyclooxygenase-2 expression. *Br J Pharmacol* 142 (2):331-8.
- Price, DD. 2002. Central neural mechanisms that interrelate sensory and affective dimensions of pain. *Mol Interv* 2 (6):392-403, 339.
- Prochazkova M, Zanvit P, Dolezal T, Prokesova L, Krsiak M. 2009. Increased gene expression and production of spinal cyclooxygenase 1 and 2 during experimental osteoarthritis pain. *Physiol Res* 58 (3):419-25.
- Qadrie ZL, Hawisa NT, Khan MW, Samuel M, Anandan R. 2009. Antinociceptive and anti-pyretic activity of *Benincasa hispida* (thunb.) cogn. in Wistar albino rats. *Pak J Pharm Sci* 22 (3):287-90.
- Qui C, Sora I, Ren K, Uhl G, Dubner R. 1998. Opioid receptor plasticity in mu opioid receptor knockout (MOR KO) mice following persistent inflammation. (Abstract). *Soc Neurosci Abs* 24:892.
- Radhakrishnan R, Bement MK, Skyba D, Sluka KA, Kehl LJ. 2004. Models of muscle pain: carrageenan model and acidic saline model. *Curr Protoc Pharmacol* Chapter 5:Unit 5 35.
- Raghavendra V, Rutkowski MD, DeLeo JA. 2002. The role of spinal neuroimmune activation in morphine tolerance/hyperalgesia in neuropathic and sham-operated rats. *J Neurosci* 22 (22):9980-9.
- Raghavendra V, Tanga F, DeLeo JA. 2003. Inhibition of microglial activation attenuates the development but not existing hypersensitivity in a rat model of neuropathy. *J Pharmacol Exp Ther* 306 (2):624-30.
- Raghavendra V, Tanga FY, DeLeo JA. 2004. Complete Freund's adjuvant-induced peripheral inflammation evokes glial activation and pro-inflammatory cytokine expression in the CNS. *European Journal of Neuroscience* 20:467-473.
- Ramer MS, Bisby MA. 1997. Rapid sprouting of sympathetic axons in dorsal root ganglia of rats with a chronic constriction injury. *Pain* 70 (2-3):237-44.
- Ramer MS, Murphy PG, Richardson PM, Bisby MA. 1998. Spinal nerve lesion-induced mechanoallodynia and adrenergic sprouting in sensory ganglia are attenuated in interleukin-6 knockout mice. *Pain* 78 (2):115-21.

- Randall LO, Selitto JJ. 1957. A method for measurement of analgesic activity on inflamed tissue. *Arch Int Pharmacodyn Ther* 111 (4):409-19.
- Ravichandran S, Panneerselvam P. 2014. Evaluation of anti-inflammatory activities of combined extracts of *Cardiospermum halicacabum* l. and *Delonix elata* l. leaves on experimental models. *International Journal of Pharmacotherapy* 4 (1):43-47.
- Raymon HK, Thode S, Zhou J, Friedman GC, Pardinias JR, Barrere C, Johnson RM, Sah DW. 1999. Immortalized human dorsal root ganglion cells differentiate into neurons with nociceptive properties. *J Neurosci* 19 (13):5420-8.
- Reeve AJ, Patel S, Fox A, Walker K, Urban L. 2000. Intrathecally administered endotoxin or cytokines produce allodynia, hyperalgesia and changes in spinal cord neuronal responses to nociceptive stimuli in the rat. *Eur J Pain* 4 (3):247-57.
- Ren K, Dubner R. 1999. Inflammatory Models of Pain and Hyperalgesia. *Ilar J* 40 (3):111-118.
- Ren K, Torres R. 2009. Role of interleukin-1beta during pain and inflammation. *Brain Res Rev* 60 (1):57-64.
- Ricciotti E, FitzGerald GA. 2011. Prostaglandins and inflammation. *Arterioscler Thromb Vasc Biol* 31 (5):986-1000.
- Ritner HL, Machelska H, Stein C. 2009. *Immune system pain and analgesia*. Edited by A. I. Basbaum, Bushnell M, *Science of pain*.
- Ro LS, Chen ST, Tang LM, Chang HS. 1996. Local application of anti-NGF blocks the collateral sprouting in rats following chronic constriction injury of the sciatic nerve. *Neurosci Lett* 218 (2):87-90.
- Rojewska E, Popiolek-Barczyk K, Jurga AM, Makuch W, Przewlocka B, Mika J. 2014. Involvement of pro- and antinociceptive factors in minocycline analgesia in rat neuropathic pain model. *J Neuroimmunol* 277 (1-2):57-66.
- Romanelli P, Esposito V. 2004. The functional anatomy of neuropathic pain. *Neurosurg Clin N Am* 15 (3):257-68.
- Romanovsky D, Wang J, Al-Chaer ED, Stimers JR, Dobretsov M. 2010. Comparison of metabolic and neuropathy profiles of rats with streptozotocin-induced overt and moderate insulinopenia. *Neuroscience* 170 (1):337-47.
- Romero-Sandoval EA, Horvath RJ, DeLeo JA. 2008. Neuroimmune interactions and pain: focus on glial-modulating targets. *Curr Opin Investig Drugs* 9 (7):726-34.
- Rowbotham MC, Fields HL. 1996. The relationship of pain, allodynia and thermal sensation in post-herpetic neuralgia. *Brain* 119 ( Pt 2):347-54.
- Rowbotham MC, Yosipovitch G, Connolly MK, Finlay D, Forde G, Fields HL. 1996. Cutaneous innervation density in the allodynic form of postherpetic neuralgia. *Neurobiol Dis* 3 (3):205-14.
- Sadzot-Delvaux C, Debrus S, Nikkels A, Piette J, Rentier B. 1995. Varicella-zoster virus latency in the adult rat is a useful model for human latent infection. *Neurology* 45 (12 Suppl 8):S18-20.
- Sadzot-Delvaux C, Merville-Louis MP, Delree P, Marc P, Piette J, Moonen G, Rentier B. 1990. An in vivo model of varicella-zoster virus latent infection of dorsal root ganglia. *J Neurosci Res* 26 (1):83-9.

- Safieh-Garabedian B, Poole S, Allchorne A, Winter J, Woolf CJ. 1995. Contribution of interleukin-1 beta to the inflammation-induced increase in nerve growth factor levels and inflammatory hyperalgesia. *Br J Pharmacol* 115 (7):1265-75.
- Saito T, Koshino T. 2000. Distribution of neuropeptides in synovium of the knee with osteoarthritis. *Clin Orthop Relat Res* (376):172-82.
- Sakat SS, Mani K, Demidchenko YO, Gorbunov EA, Tarasov SA, Mathur A, Epstein OI. 2014. Release-active dilutions of diclofenac enhance anti-inflammatory effect of diclofenac in carrageenan-induced rat paw edema model. *Inflammation* 37 (1):1-9.
- Salo PT, Theriault E. 1997. Number, distribution and neuropeptide content of rat knee joint afferents. *J Anat* 190 ( Pt 4):515-22.
- Salvemini D, Wang ZQ, Wyatt PS, Bourdon DM, Marino MH, Manning PT, Currie MG. 1996. Nitric oxide: a key mediator in the early and late phase of carrageenan-induced rat paw inflammation. *Br J Pharmacol* 118 (4):829-38.
- Sandkuhler, J. 2009. Models and mechanisms of hyperalgesia and allodynia. *Physiol Rev* 89 (2):707-58.
- Sarzi-Puttini P, Cimmino MA, Scarpa R, Caporali R, Parazzini F, Zaninelli A, Atzeni F, Canesi B. 2005. Osteoarthritis: an overview of the disease and its treatment strategies. *Semin Arthritis Rheum* 35 (1 Suppl 1):1-10.
- Sawada M, Suzumura A, Hosoya H, Marunouchi T, Nagatsu T. 1999. Interleukin-10 inhibits both production of cytokines and expression of cytokine receptors in microglia. *J Neurochem* 72 (4):1466-71.
- Saxena K, Patro N, Patro I. 2007. FK506 protects neurons following peripheral nerve injury via immunosuppression. *Cell Mol Neurobiol* 27 (8):1049-57.
- Scadding, J. 2003. Neuropathic pain. *ACNR* 3 (2):8-12.
- Schafers M, Brinkhoff J, Neukirchen S, Marziniak M, Sommer C. 2001. Combined epineurial therapy with neutralizing antibodies to tumor necrosis factor-alpha and interleukin-1 receptor has an additive effect in reducing neuropathic pain in mice. *Neurosci Lett* 310 (2-3):113-6.
- Schafers M, Svensson CI, Somme, C, Sorkin LS. 2003. Tumor necrosis factor-alpha induces mechanical allodynia after spinal nerve ligation by activation of p38 MAPK in primary sensory neurons. *J Neurosci* 23 (7):2517-21.
- Schaible HG, Del Rosso A, Maticci-Cerinic M. 2005. Neurogenic aspects of inflammation. *Rheum Dis Clin North Am* 31 (1):77-101, ix.
- Schaible HG, Ebersberger A, von Banchet GS. 2002. Mechanisms of pain in arthritis. *Ann N Y Acad Sci* 966:343-54.
- Schaible HG, Schmidt RF, Willis WD. 1987. Enhancement of the responses of ascending tract cells in the cat spinal cord by acute inflammation of the knee joint. *Exp Brain Res* 66 (3):489-99.
- Schuelert N, McDougall JJ. 2009. Grading of monosodium iodoacetate-induced osteoarthritis reveals a concentration-dependent sensitization of nociceptors in the knee joint of the rat. *Neurosci Lett* 465 (2):184-8.

- Schunke M, Tillmann B, Bruck M, Muller-Ruchholtz W. 1988. Morphologic characteristics of developing osteoarthrotic lesions in the knee cartilage of STR/IN mice. *Arthritis Rheum* 31 (7):898-905.
- Schwei MJ, Honore P, Rogers SD, Salak-Johnson JL, Finke MP, Ramnarain M L, Clohisy DR, Mantyh PW. 1999. Neurochemical and cellular reorganization of the spinal cord in a murine model of bone cancer pain. *J Neurosci* 19 (24):10886-97.
- Scott DT, Lam FY, Ferrell WR. 1994. Acute joint inflammation--mechanisms and mediators. *Gen Pharmacol* 25 (7):1285-96.
- Seibert K, Zhang Y, Leahy K, Hauser S, Masferrer J, Perkins W, Lee L, Isakson P. 1994. Pharmacological and biochemical demonstration of the role of cyclooxygenase 2 in inflammation and pain. *Proc Natl Acad Sci U S A* 91 (25):12013-7.
- Seltzer Z, Dubner R, Shir Y. 1990. A novel behavioral model of neuropathic pain disorders produced in rats by partial sciatic nerve injury. *Pain* 43 (2):205-18.
- Sendzik J, Lode H, Stahlmann R. 2009. Quinolone-induced arthropathy: an update focusing on new mechanistic and clinical data. *Int J Antimicrob Agents* 33 (3):194-200.
- Shamash S, Reichert F, Rotshenker S. 2002. The cytokine network of Wallerian degeneration: tumor necrosis factor-alpha, interleukin-1alpha, and interleukin-1beta. *J Neurosci* 22 (8):3052-60.
- Shimoyama M, Tanaka K, Hasue F, Shimoyama N. 2002. A mouse model of neuropathic cancer pain. *Pain* 99 (1-2):167-74.
- Siegmund E, Cadmus R, Lu G. 1957a. A method for evaluating both non-narcotic and narcotic analgesics. *Proc Soc Exp Biol Med* 95 (4):729-31.
- Siegmund EA, Cadmus RA, Go L. 1957b. Screening of analgesics, including aspirin-type compounds, based upon the antagonism of chemically induced writhing in mice. *J Pharmacol Exp Ther* 119 (184).
- Silberberg R, Saxton J, Sperling G. 1952. Degenerative joint disease in Syrian hamsters. *Fed Proc* 11:427-432.
- Silva FRF, Dore CMPG, Margues CT, Nascimento MS, Benevides NMB, Rocha HAO, Chavante SF, Leite EL. 2010. Anticoagulant activity, paw edema and pleurisy induced carrageenan: Action of major types of commercial carrageenans. *Carbohydrate Polymers* 79:26-33.
- Sima, AA. 1980. Peripheral neuropathy in the spontaneously diabetic BB-Wistar-rat. An ultrastructural study. *Acta Neuropathol* 51 (3):223-7.
- Simmons Z, Feldman EL. 2002. Update on diabetic neuropathy. *Curr Opin Neurol* 15 (5):595-603.
- Sivilotti L, Woolf CJ. 1994. The contribution of GABAA and glycine receptors to central sensitization: disinhibition and touch-evoked allodynia in the spinal cord. *J Neurophysiol* 72 (1):169-79.
- Smith GN, Myers SL Jr., Brandt KD, Mickler EA, Albrecht ME. 1999. Diacerhein treatment reduces the severity of osteoarthritis in the canine cruciate-deficiency model of osteoarthritis. *Arthritis Rheum* 42 (3):545-54.

- Smith M, Mills EJ. 2001. Select complementary/alternative therapies for prostate cancer: the benefits and risks. *Cancer Pract* 9 (5):253-5.
- Sommer C, Lindenlaub T, Teuteberg P, Schafers M, Hartung T, Toyka KV. 2001a. Anti-TNF-neutralizing antibodies reduce pain-related behavior in two different mouse models of painful mononeuropathy. *Brain Res* 913 (1):86-9.
- Sommer C, Petrusch S, Lindenlaub T, Toyka KV. 1999. Neutralizing antibodies to interleukin 1-receptor reduce pain associated behavior in mice with experimental neuropathy. *Neurosci Lett* 270 (1):25-8.
- Sommer C, Schafers M. 1998. Painful mononeuropathy in C57BL/Wld mice with delayed wallerian degeneration: differential effects of cytokine production and nerve regeneration on thermal and mechanical hypersensitivity. *Brain Res* 784 (1-2):154-62.
- Sommer C, Schafers M, Marziniak M, Toyka KV. 2001b. Etanercept reduces hyperalgesia in experimental painful neuropathy. *J Peripher Nerv Syst* 6 (2):67-72.
- Sommer C, Schäfers M. 2004. Mechanisms of neuropathic pain: the role of cytokines. *Drug Discovery Today: Disease Mechanisms* 1 (4):441-448.
- Sorkin LS, Xiao WH, Wagner R, Myers RR. 1997. Tumour necrosis factor-alpha induces ectopic activity in nociceptive primary afferent fibres. *Neuroscience* 81 (1):255-62.
- Stiller CO, Cui JG, O'Connor WT, Brodin E, Meyerson B, Linderoth B. 1996. Release of gamma-aminobutyric acid in the dorsal horn and suppression of tactile allodynia by spinal cord stimulation in mononeuropathic rats. *Neurosurgery* 39 (2):367-74; discussion 374-5.
- Stillman, M. 2006. Clinical approach to patients with neuropathic pain. *Cleve Clin J Med* 73 (8):726-8, 729-30, 733-6 passim.
- Stohler CS, Zhang X, Ashton-Miller JA. 1991. *An experimental model of jaw muscle pain in man*. Edited by D. Z, *The biological mechanisms of tooth movement and craniofacial adaptation*. Birmingham: EBSCO Media.
- Sugishita E, Amagaya S, Ogihara Y. 1981. Anti-inflammatory testing methods: comparative evaluation of mice and rats. *J Pharmacobiodyn* 4 (8):565-75.
- Sugiura S, Lahav R, Han J, Kou SY, Banner LR, de Pablo F, Patterson PH. 2000. Leukaemia inhibitory factor is required for normal inflammatory responses to injury in the peripheral and central nervous systems in vivo and is chemotactic for macrophages in vitro. *Eur J Neurosci* 12 (2):457-66.
- Svensson CI, Tran TK, Fitzsimmons B, Yaksh TL, Hua XY. 2006. Descending serotonergic facilitation of spinal ERK activation and pain behavior. *FEBS Lett* 580 (28-29):6629-34.
- Sweitzer S, Martin D, DeLeo JA. 2001a. Intrathecal interleukin-1 receptor antagonist in combination with soluble tumor necrosis factor receptor exhibits an anti-allodynic action in a rat model of neuropathic pain. *Neuroscience* 103 (2):529-39.
- Sweitzer SM, Arruda JL, DeLeo JA. 2001b. *The cytokine challenge: methods for the detection of central cytokines in rodent models of persistent pain.* Kruger L ed, *methods in Pain research*. New York: CRC.

- Sweitzer SM, Colburn RW, Rutkowski M, DeLeo JA. 1999. Acute peripheral inflammation induces moderate glial activation and spinal IL-1beta expression that correlates with pain behavior in the rat. *Brain Res* 829 (1-2):209-21.
- Sweitzer SM, Schubert P, DeLeo JA. 2001c. Propentofylline, a glial modulating agent, exhibits antiallodynic properties in a rat model of neuropathic pain. *J Pharmacol Exp Ther* 297 (3):1210-7.
- Syriatowicz JP, Hu D, Walker JS, Tracey DJ. 1999. Hyperalgesia due to nerve injury: role of prostaglandins. *Neuroscience* 94 (2):587-94.
- Takahashi N, Kikuchi S, Shubayev VI, Campana WM, Myers RR. 2006. TNF-alpha and phosphorylation of ERK in DRG and spinal cord: insights into mechanisms of sciatica. *Spine (Phila Pa 1976)* 31 (5):523-9.
- Tal M, Bennett G J. 1993. Dextrorphan relieves neuropathic heat-evoked hyperalgesia in the rat. *Neurosci Lett* 151 (1):107-10.
- Tanga FY, Nutile-McMenemy N, DeLeo JA. 2005. The CNS role of Toll-like receptor 4 in innate neuroimmunity and painful neuropathy. *Proc Natl Acad Sci U S A* 102 (16):5856-61.
- Tawfik VL, Nutile-McMenemy N, Lacroix-Fralish ML, Deleo JA. 2007. Efficacy of propentofylline, a glial modulating agent, on existing mechanical allodynia following peripheral nerve injury. *Brain Behav Immun* 21 (2):238-46.
- Thacker MA, Clark AK, Marchand F, McMahon SB. 2007. Pathophysiology of peripheral neuropathic pain: immune cells and molecules. *Anesth Analg* 105 (3):838-47.
- Thakare VN, Suralkar AA, Deshpande AD, Naik SR. 2010. Stem bark extraction of *Ficus bengalensis* Linn for anti-inflammatory and analgesic activity in animal models. *Indian J Exp Biol* 48 (1):39-45.
- Tjolsen A, Berge OG, Hunskaar S, Rosland JH, Hole K. 1992. The formalin test: an evaluation of the method. *Pain* 51 (1):5-17.
- Todd, AJ. 2010. Neuronal circuitry for pain processing in the dorsal horn. *Nat Rev Neurosci* 11 (12):823-36.
- Tonussi CR, Ferreira SH. 1992. Rat knee-joint carrageenin incapacitation test: an objective screen for central and peripheral analgesics. *Pain* 48 (3):421-7.
- Torsney C, MacDermott AB. 2006. Disinhibition opens the gate to pathological pain signaling in superficial neurokinin 1 receptor-expressing neurons in rat spinal cord. *J Neurosci* 26 (6):1833-43.
- Treede RD, Jensen TS, Campbell JN, Cruccu G, Dostrovsky JO, Griffin JW, Hansson P, Hughes R, Nurmikko T, Serra J. 2008. Neuropathic pain: redefinition and a grading system for clinical and research purposes. *Neurology* 70 (18):1630-5.
- Tsuda M, Ueno H, Kataoka A, Tozaki-Saitoh H, Inoue K. 2003. Activation of dorsal horn microglia contributes to diabetes-induced tactile allodynia via extracellular signal-regulated protein kinase signaling. *Adv Exp Med Biol* 521:1-21.
- Tsuda M, Ueno H, Kataoka A, Tozaki-Saitoh H, Inoue K. 2008. Activation of dorsal horn microglia contributes to diabetes-induced tactile allodynia via extracellular signal-regulated protein kinase signaling. *Glia* 56 (4):378-86.

- Tumati S, Largent-Milnes TM, Keresztes A, Ren J, Roeske WR, Vanderah TW, Varga EV. 2012. Repeated morphine treatment-mediated hyperalgesia, allodynia and spinal glial activation are blocked by co-administration of a selective cannabinoid receptor type-2 agonist. *J Neuroimmunol* 244 (1-2):23-31.
- Unrelieved pain is a major global health care problem.* . International Association for the Study of Pain [cited. Available from [<http://www.iasp-pain.org/AM/template.cfm?Section=Home&Template=/CM/ContentDisplay.cfm&ContentID=2908>].
- Vallejo R, Tilley DM, Vogel L, Benyamin R. 2010. The role of glia and the immune system in the development and maintenance of neuropathic pain. . *Pain Pract* 10:167-184.
- Van der Wende C, Margolin S. 1956. Analgesic tests based upon experimentally induced acute abdominal pain. . *Fed. Proc.* 15:494-.
- Vane JR, Bakhle YS, Botting RM. 1998. Cyclooxygenases 1 and 2. *Annu Rev Pharmacol Toxicol* 38:97-120.
- Vanegas H, Schaible HG. 2001. Prostaglandins and cyclooxygenases [correction of cyclooxygenases] in the spinal cord. *Prog Neurobiol* 64 (4):327-63.
- Vasko MR, Campbell WB, Waite KJ. 1994. Prostaglandin E2 enhances bradykinin-stimulated release of neuropeptides from rat sensory neurons in culture. *J Neurosci* 14 (8):4987-97.
- Vecht, CJ. 2000. Cancer pain: a neurological perspective. *Curr Opin Neurol* 13 (6):649-53.
- Vincent AL, Rodrick GE, Sodeman WA Jr. 1979. The pathology of the Mongolian Gerbil (*Meriones unguiculatus*): a review. *Lab Anim Sci* 29 (5):645-51.
- Visco DM, Hill MA, Widmer WR, Johnstone B, Myers SL. 1996. Experimental osteoarthritis in dogs: a comparison of the Pond-Nuki and medial arthrotomy methods. *Osteoarthritis Cartilage* 4 (1):9-22.
- von Frey M. 1922. Verspatete schmerzempfindungen. *Z Gesamte Neurol Psychiat* 79:324-333.
- von Hehn CA, Baron R, Woolf CJ. 2012. Deconstructing the neuropathic pain phenotype to reveal neural mechanisms. *Neuron* 73 (4):638-52.
- Vonsy JL, Ghandehari J, Dickenson AH. 2009. Differential analgesic effects of morphine and gabapentin on behavioural measures of pain and disability in a model of osteoarthritis pain in rats. *Eur J Pain* 13 (8):786-93.
- . 2009. Differential analgesic effects of morphine and gabapentin on behavioural measures of pain and disability in a model of osteoarthritis pain in rats. *Eur J Pain* 13 (8):786-93.
- Voscopoulos C, Lema M. 2010. When does acute pain become chronic? *Br J Anaesth* 105 Suppl 1:i69-85.
- Vranken, JH. 2012. Elucidation of pathophysiology and treatment of neuropathic pain. *Cent Nerv Syst Agents Med Chem* 12 (4):304-14.
- Wacnik PW, Eikmeier LJ, Ruggles TR, Ramnaraine ML, Walcheck BK, Beitz AJ, Wilcox GL. 2001. Functional interactions between tumor and peripheral nerve: morphology, antigen identification, and behavioral characterization of a new murine model of cancer pain. *J Neurosci* 21 (23):9355-66.

- Wagner R, Myers RR. 1996. Schwann cells produce tumor necrosis factor alpha: expression in injured and non-injured nerves. *Neuroscience* 73 (3):625-9.
- Walker K, Medhurst SJ, Kidd BL, Glatt M, Bowes M, Patel S, McNair K, Kesingland A, Green J, Chan, O., Fox AJ, Urban LA. 2002. Disease modifying and anti-nociceptive effects of the bisphosphonate, zoledronic acid in a model of bone cancer pain. *Pain* 100 (3):219-29.
- Wall, PD. 1991. Neuropathic pain and injured nerve: central mechanisms. *Br Med Bull* 47 (3):631-43.
- Wall PD, Devor M, Inbal R, Scadding JW, Schonfeld D, Seltzer Z, Tomkiewicz MM. 1979. Autotomy following peripheral nerve lesions: experimental anaesthesia dolorosa. *Pain* 7 (2):103-11.
- Wall PD, Gutnick M. 1974. Ongoing activity in peripheral nerves: the physiology and pharmacology of impulses originating from a neuroma. *Exp Neurol* 43 (3):580-93.
- Wall PD, Woolf CJ. 1986. The brief and the prolonged facilitatory effects of unmyelinated afferent input on the rat spinal cord are independently influenced by peripheral nerve section. *Neuroscience* 17 (4):1199-205.
- Wallace, JL. 2008. Prostaglandins, NSAIDs, and gastric mucosal protection: why doesn't the stomach digest itself? *Physiol Rev* 88 (4):1547-65.
- Wallace VCJ, Rice ASC. 2008. *Applied physiology: neuropathic pain, clinical pain management – chronic pain volume* Edited by W. Wilson, Haythornthwaite, Jensen, . London: Hodder Arnold.
- Wang LX, Wang ZJ. 2003. Animal and cellular models of chronic pain. *Adv Drug Deliv Rev* 55 (8):949-65.
- Watkins LR, Martin D, Ulrich P, Tracey KJ, Maier SF. 1997. Evidence for the involvement of spinal cord glia in subcutaneous formalin induced hyperalgesia in the rat. *Pain* 71 (3):225-35.
- Watkins LR, Milligan ED, Maier SF. 2001a. Glial activation: a driving force for pathological pain. *Trends Neurosci* 24 (8):450-5.
- . 2001b. Spinal cord glia: new players in pain. *Pain* 93 (3):201-5.
- . 2003a. Glial proinflammatory cytokines mediate exaggerated pain states: implications for clinical pain. *Adv Exp Med Biol* 521:1-21.
- Watkins LR, Maier SF. 2000. The pain of being sick: implications of immune-to-brain communication for understanding pain. *Annu Rev Psychol* 51:29-57.
- . 2003b. Glia: a novel drug discovery target for clinical pain. *Nat Rev Drug Discov* 2 (12):973-85.
- Watson BD, Prado R, Dietrich WD, Ginsberg MD, Green BA. 1986. Photochemically induced spinal cord injury in the rat. *Brain Res* 367 (1-2):296-300.
- Wattiez AS, Barriere DA, Dupuis A, Courteix C. 2012. Rodent models of painful diabetic neuropathy: What can we learn from them? *Diabetes Metab* S5 008.
- Wei F, Guo W, Zou S, Ren K, Dubner R. 2008. Supraspinal glial-neuronal interactions contribute to descending pain facilitation. *J Neurosci* 28 (42):10482-95.

- Wen YR, Tan PH, Cheng JK, Liu YC, Ji RR. 2011. Microglia: a promising target for treating neuropathic and postoperative pain, and morphine tolerance. *J Formos Med Assoc* 110 (8):487-94.
- White FA, Jung H, Miller RJ. 2007. Chemokines and the pathophysiology of neuropathic pain. *Proc Natl Acad Sci U S A* 104 (51):20151-8.
- Wieseler-Frank J, Maier SF, Watkins LR. 2005. Central proinflammatory cytokines and pain enhancement. *Neurosignals* 14 (4):166-74.
- Wigdor S, Wilcox GL. 1987. Central and systemic morphine-induced antinociception in mice: contribution of descending serotonergic and noradrenergic pathways. *J Pharmacol Exp Ther* 242 (1):90-5.
- Wilcox, GL. 1988. Pharmacological studies of grooming and scratching behavior elicited by spinal substance P and excitatory amino acids. *Ann N Y Acad Sci* 525:228-36.
- Wild S, Roglic G, Green A, Sicree R, King H. 2004. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care* 27 (5):1047-53.
- Willenbring S, Beauprie IG, DeLeo JA. 1995a. Sciatic cryoneurolysis in rats: a model of sympathetically independent pain. Part 1: Effects of sympathectomy. *Anesth Analg* 81 (3):544-8.
- Willenbring S, DeLeo JA, Coombs DW. 1995b. Sciatic cryoneurolysis in rats: a model of sympathetically independent pain. Part 2: Adrenergic pharmacology. *Anesth Analg* 81 (3):549-54.
- Williams JM, Brandt KD. 1985. Triamcinolone hexacetonide protects against fibrillation and osteophyte formation following chemically induced articular cartilage damage. *Arthritis Rheum* 28 (11):1267-74.
- Willis, WD. 2002. Long-term potentiation in spinothalamic neurons. *Brain Res Brain Res Rev* 40 (1-3):202-14.
- Willis WD, Westlund KN. 1997. Neuroanatomy of the pain system and of the pathways that modulate pain. *J Clin Neurophysiol* 14 (1):2-31.
- Winkelstein BA, DeLeo JA. 2002. Nerve root injury severity differentially modulates spinal glial activation in a rat lumbar radiculopathy model: considerations for persistent pain. *Brain Res* 956 (2):294-301.
- Winkelstein BA, Rutkowski MD, Sweitzer SM, Pahl JL, DeLeo JA. 2001. Nerve injury proximal or distal to the DRG induces similar spinal glial activation and selective cytokine expression but differential behavioral responses to pharmacologic treatment. *J Comp Neurol* 439 (2):127-39.
- Winter CA, Risley EA, Nuss GW. 1962. Carrageenin-induced edema in hind paw of the rat as an assay for antiinflammatory drugs. *Proc Soc Exp Biol Med* 111:544-7.
- Witter J, Dionne RA. 2004. What can chronic arthritis pain teach about developing new analgesic drugs? *Arthritis Res Ther* 6 (6):279-81.
- Wodarski R, Clark AK, Grist J, Marchand F, Malcangio M. 2009. Gabapentin reverses microglial activation in the spinal cord of streptozotocin-induced diabetic rats. *Eur J Pain* 13 (8):807-11.

- Wood JN, Bevan SJ, Coote PR, Dunn PM, Harmar A, Hogan P, Latchman DS, Morrison C, Rougon G, Theveniau M, et al. 1990. Novel cell lines display properties of nociceptive sensory neurons. *Proc Biol Sci* 241 (1302):187-94.
- Woolf, CJ. 1983. Evidence for a central component of post-injury pain hypersensitivity. *Nature* 306 (5944):686-8.
- . 1991. Generation of acute pain: central mechanisms. *Br Med Bull* 47 (3):523-33.
- Woolf CJ, Salter MW. 2000. Neuronal plasticity: increasing the gain in pain. *Science* 288 (5472):1765-9.
- Woolf CJ, Thompson SW. 1991. The induction and maintenance of central sensitization is dependent on N-methyl-D-aspartic acid receptor activation; implications for the treatment of post-injury pain hypersensitivity states. *Pain* 44 (3):293-9.
- Woolfe G, MacDonald AD. 1944. The evaluation of the analgesic action of pethidine hydrochloride (DEMEROL). *J Pharmacol Exper Ther* 80:300-307.
- Wuarin-Bierman L, Zahnd GR, Kaufmann F, Burcklen L, Adler J. 1987. Hyperalgesia in spontaneous and experimental animal models of diabetic neuropathy. *Diabetologia* 30 (8):653-8.
- Xing H, Chen M, Ling J, Tan W, Gu JG. 2007. TRPM8 mechanism of cold allodynia after chronic nerve injury. *J Neurosci* 27 (50):13680-90.
- Xu Q, Yaksh TL. 2011. A brief comparison of the pathophysiology of inflammatory versus neuropathic pain. *Curr Opin Anaesthesiol* 24 (4):400-7.
- Yaksh, TL. 1989. Behavioral and autonomic correlates of the tactile evoked allodynia produced by spinal glycine inhibition: effects of modulatory receptor systems and excitatory amino acid antagonists. *Pain* 37 (1):111-23.
- . 1999. Spinal systems and pain processing: development of novel analgesic drugs with mechanistically defined models. *Trends Pharmacol Sci* 20 (8):329-37.
- Yamamoto T, Nozaki-Taguchi N. 1996. Analysis of the effects of cyclooxygenase (COX)-1 and COX-2 in spinal nociceptive transmission using indomethacin, a non-selective COX inhibitor, and NS-398, a COX-2 selective inhibitor. *Brain Res* 739 (1-2):104-10.
- . 2002. The role of cyclooxygenase-1 and -2 in the rat formalin test. *Anesth Analg* 94 (4):962-7, table of contents.
- Yamamoto T, Sakashita, Y. 1998. COX-2 inhibitor prevents the development of hyperalgesia induced by intrathecal NMDA or AMPA. *Neuroreport* 9 (17):3869-73.
- Yeziarski RP, Park SH. 1993. The mechanosensitivity of spinal sensory neurons following intraspinal injections of quisqualic acid in the rat. *Neurosci Lett* 157 (1):115-9.
- Yoon MH, Yaksh TL. 1999. Evaluation of interaction between gabapentin and ibuprofen on the formalin test in rats. *Anesthesiology* 91 (4):1006-13.
- Zhang JM, Li H, Munir MA. 2004. Decreasing sympathetic sprouting in pathologic sensory ganglia: a new mechanism for treating neuropathic pain using lidocaine. *Pain* 109 (1-2):143-9.

- Zhao Z, Chen SR, Eisenach JC, Busija DW, Pan HL. 2000. Spinal cyclooxygenase-2 is involved in development of allodynia after nerve injury in rats. *Neuroscience* 97 (4):743-8.
- Zhou H, Wong YF, Cai X, Liu ZQ, Jiang ZH, Bian ZX, Xu HX, Liu L. 2006. Suppressive effects of JCICM-6, the extract of an anti-arthritic herbal formula, on the experimental inflammatory and nociceptive models in rodents. *Biol Pharm Bull* 29 (2):253-60.
- Zhu X, Eisenach JC. 2003. Cyclooxygenase-1 in the spinal cord is altered after peripheral nerve injury. *Anesthesiology* 99 (5):1175-9.
- Zhu XY, Huang CS, Li Q, Chang RM, Song ZB, Zou WY, Guo QL. 2012. p300 exerts an epigenetic role in chronic neuropathic pain through its acetyltransferase activity in rats following chronic constriction injury (CCI). *Mol Pain* 8:84.
- Ziegler EA, Magerl W, Meyer RA, Treede RD. 1999. Secondary hyperalgesia to punctate mechanical stimuli. Central sensitization to A-fibre nociceptor input. *Brain* 122 ( Pt 12):2245-57.
- Zimmermann, M. 1983. Ethical guidelines for investigations of experimental pain in conscious animals. *Pain* 16 (2):109-10.
- . 2001. Pathobiology of neuropathic pain. *Eur J Pharmacol* 429 (1-3):23-37.
- Zychowska M, Rojewska E, Kreiner G, Nalepa I, Przewlocka B, Mika J. 2013. Minocycline influences the anti-inflammatory interleukins and enhances the effectiveness of morphine under mice diabetic neuropathy. *J Neuroimmunol* 262 (1-2):35-45.