

PinPrick stimulators - Publications

- LP Andersen, Gögenur, AQ Fenger, MC Petersen, J Rosenberg, MU Werner, Analgesic and antihyperalgesic effects of melatonin in a human inflammatory pain model: a randomized, double-blind, placebo-controlled, three-arm crossover study. *Pain* 156 (2015), 2286-2294
- M.S. Asghar, M.P. Pereira, M.U. Werner, J. Martensson, H. Larsson, J.B. Dahl, Secondary Hyperalgesia Phenotypes Exhibit Differences in Brain Activation during Noxious Stimulation. *PLoS One* (2015, Jan 23)
- M.M. Backonja, N. Attal, R. Baron, D. Bouhassira, M. Drangholt, D. Ziegler et al.: Value of quantitative sensory testing in neurological and pain disorders: NeuPSIG consensus. *Pain* 154 (2013), 1807-1819
- S. Benson, L. Rebernik, A. Wegner, J. Kleine-Borgemann, H. Engler, M. Schlamann, M. Forsting, M. Schedlowski, S. Elsenbruch: Neural circuitry mediating inflammation-induced central pain amplification in human experimental endotoxemia. *Brain Behav Immun* 48 (2015), 222-231
- M. Blankenburg, H. Boekens, T. Hechler, C. Maier, E. Krumova, A. Scherens, W. Magerl, F. Aksu, B. Zernikow: Reference values for quantitative sensory testing in children and adolescents: Developmental and gender differences of somatosensory perception. *Pain* 149 (2010), 76-88
- M. Blankenburg, H. Boekens, T. Hechler, C. Maier, E. Krumova, A. Scherens, W. Magerl, F. Aksu, B. Zernikow: Quantitative Sensorische Testung bei Kindern und Jugendlichen nach dem Protokoll des Deutschen Forschungsverbundes Neuopathischer Schmerz (DFNS). *Schmerz* 24 (2010), 380-382
- M. Brenner: Dissertation: Quantitative Sensorische Testung bei Patienten mit Hepatischer Enzephalopathie. Heinrich-Heine-Universität Düsseldorf (2016)
- V. Dimova, B.G. Oertel, G. Kabakci, M. Zimmermann, H. Hermens, S. Lauterbacher, A. Ultsch, J. Lötsch: A More Pessimistic Life Orientation Is Associated With Experimental Inducibility of a Neuropathy-like Pain Pattern in Healthy Individuals. *Jpain Vol 16/8* (2015), 791-800
- I. Fißmer, T. Klein, W. Magerl, R.D. Treede, P.K. Zahn, E.M. Pogatzki-Zahn: Modality-specific somatosensory changes in a human surrogate model of postoperative pain. *Anesthesiology* 115 ((2011), 387-397
- C. Geber, T. Klein, S. Azad, F. Birklein, J. Gierthmuehlen, V. Hüge, M. Lauchart, D. Nitzsche, M. Stengel, M. Valet, R. Baron, C. Maier, T. Toelle, R.-D. Treede: Test-retest and interobserver reliability of quantitative sensory testing according to the protocol of the German Research Network on Neuropathic Pain (DFNS): A multi-centre study. *Pain* 152 (2011), 548–556
- J. Gehling, T. Mainka, J. Vollert, E.M. Pogatzki-Zahn, C. Maier, E. K. Enax-Krumova: Short-term test-retest-reliability of conditioned pain modulation using the cold-heat-pain method in healthy subjects and its correlation to parameters of standardized quantitative sensory testing. *BMC Neurology* 16 (2016)
- S. Goksan, C. Hartley, F. Emery, N. Cockrill, R. Poorun, F. Moultrie, R. Rogers, J. Campbell, M. Sanders, E. Adams, S. Clare, M. Jenkinson, I. Tracey, R. Slater: fMRI reveals neural activity overlap between adult and infant pain. *elife* (2015)

- B. Gustorff, T. Sycha, D. Lieba-Samal, R. Rolke, R.D. Treede, W. Magerl: The pattern and time course of somatosensory changes in the human UVB sunburn model reveal the presence of peripheral and central sensitization. *Pain* 154 (2013), 586-597
- C. Hartley, S. Goksan, R. Poorun, K. Brotherhood, G.S. Mellado, F. Moultrie, R. Rogers, E. Adams, R. Slater. The relationship between nociceptive brain activity, spinal reflex withdrawal and behaviour in newborn infants. *Sci. Rep.* 5 (2015)
- C. Hartley, R. Poorun, S. Goksan, A. Worley, S. Boyd, R. Rogers, T. Ali, R. Slater: Noxious stimulation in children receiving general anaesthesia evokes an increase in delta frequency brain activity. *Pain* 155 (2014), 2368-2376
- F. Henrich, W. Magerl, T. Klein, W. Greffrath, R.-D. Treede: Capsaicin-sensitive C- and A-fibre nociceptors control long-term potentiation-like pain amplification in humans. *Brain* (2015), 16 pages
- G.D. Ianetti, U. Baumgaertner, I. Tracey, R.D. Treede, W. Magerl, Pinprick-evoked brain potentials (PEPs): a novel tool to assess central sensitization of nociceptive pathways in humans. *J Neurophysiol*, 110, 5 (2013), 1107-1116
- T.P. Jürgens, A. Sawatzki, F. Henrich, W. Magerl, A. May: An improved model of heat-induced hyperalgesia - repetitive phasic heat pain causing primary hyperalgesia to heat and secondary hyperalgesia to pinprick and light touch. *PloS One* 9 (2014, June)
- T. P. Jürgens, A. Schulte, T. Klein, A. May: Transcranial direct current stimulation does neither modulate results of a quantitative sensory testing protocol nor ratings of suprathreshold heat stimuli in healthy volunteers. *Eur J Pain* 2012 Oct;16(9):1251-63
- T. Klein, W. Magerl, A. Hanschmann, M. Althaus, R.-D. Treede: Antihyperalgesic and analgesic properties of the N-methyl-D-aspartate (NMDA) receptor antagonist neramexane in a human surrogate model of neurogenic hyperalgesia. *European Journal of Pain*, 12 (2008), 17-19
- E.K. Krumova, J. Frettlöh, S. Klauenberg, H. Richter, G. Wasner, C. Maier, Long-term skin temperature measurements – A practical diagnostic tool in complex regional pain syndrome. *Pain* 140 (2008), 8-22
- I. Lee, C. Wallraven, J. Kong, D.S. Chang, H. Lee, H.J. Park, Y. Chae: When pain is not only pain: Inserting needles into the body evokes distinct reward-related brain responses in the context of a treatment. *Physiol Behav* 140 (2015), 148-155
- W. Magerl, P. N. Fuchs, R. A. Mayer, R.-D. Treede: Roles of capsaicin-insensitive nociceptors in pain and secondary hyperalgesia. *Brain* 124 (2001), 257-268
- W. Magerl, E. Krumova, R. Baron, T. Toelle, R.-D. Treede, C. Maier: Reference data for quantitative sensory testing (QST): Refined stratification for age and a novel method for statistical comparison of group data. *Pain*, 151 (2010) 598–605
- C. Maier, R. Baron, T. R. Toelle, A. Binder, N. Birbaumer, F. Birklein, J. Gierthmuehlen, H. Flor, C. Geber, V. Hüge, E. K. Krumova, G. B. Landwehrmeyer, W. Magerl, C. Maihofer, H. Richter, R. Rolke, A. Scherens, A. Schwarz, C. Sommer, V. Tronnier, N. Ueçeyler, M. Valet, G. Wasner, R.-D. Treede: Quantitative sensory testing in the German Research Network on Neuropathic Pain (DFNS): Somatosensory abnormalities in 1236 patients with different neuropathic pain syndromes. *Pain* 150 (2010), 439–450
- E. Mauermann, C. A. Blum, G. L. Buse, O. Bandschapp, W. Ruppen: Time course of copeptin during a model of experimental pain and hyperalgesia. *Eur J Anaesthesiol* (2017); 34:1-9
- C.H. Meyer-Frießem, L.M. Haag, T. Schmidt-Wilcke, W. Magerl, E.M. Pokatzki-Zahn, M.

- Tegenthoff, P.K. Zahn: Transcutaneous spinal DC stimulation reduces pain sensitivity in humans. *Neurosci Lett*, 589 (2015), 153-158
- M Muecke, H Cuhls, L Radbruch, T Weigl, R Rolke: Evidence of Heterosynaptic LTD in the Human Nociceptive System: Superficial Skin Neuromodulation Using a Matrix Electrode Reduces Deep Pain Sensitivity. *PloS One* (2014), Vol 9,9
 - M Muecke, H Cuhls, L Radbruch, R Baron, C Maier, T Toelle, RD Treede, R Rolke: Quantitative sensorische Testung, *Der Schmerz* (2014)
 - M Muecke, H Cuhls, L Radbruch, R Baron, C Maier, T Toelle, RD Treede, R Rolke: Quantitative sensory testing (QST), *Der Schmerz* (2015)
 - J. Naoum, S. Reitz, A. Krause-Utz, N. Kleindienst, F. Willis, S. Kuniss, U. Baumgaertner, F. Mancke, RD. Treede, C. Schmahl: The role of seeing blood in non-suicidal self-injury in female patients with borderline personality disorder. *Psych Res* 246 (2016), 676-682
 - H. Ohnesorge, A. Alpes, R. Baron, J. Gierthmuehlen: Influence of intraoperative remifentanyl and sufentanyl on sensory perception: a randomized trial. *Curr Med Res Opin* (2016)
 - H. O'Leary, K.M. Smart, N.A. Moloney, C. Blake, C. M. Doody: Pain sensitisation and the risk of poor outcome following physiotherapy for patients with moderate to severe knee osteoarthritis: protocol for a prospective cohort study. *BMJ Open* (2015)
 - J. O'Neill, S. Sikandar, S.B. MacMahon, A.H. Dickenson: Human psychophysics and rodent spinal neurones exhibit peripheral and central mechanisms of inflammatory pain in the UVB and UVB heat rekindling models. *J Psychol* 593 (2015), 4029-4042
 - L. Oudejans, X. He, M. Niesters, A. Dahan, M. Brines, M. vanVelzen: Cornea nerve fiber quantification and construction of phenotypes in patients with fibromyalgia. *Nature Srep* 23573 (2016)
 - M.P. Pereira, R.R. Donahue, J.B. Dahl, M. Werner, B.K. Taylor, M.U. Werner, Endogenous Opioid-Masked Latent Pain Sensitization: Studies from Mouse to Human, *PloS One*, 2015, Aug 25)
 - M.P. Pereira, M.U. Werner, T.K. Ringsted, M.C. Rowbotham, B.K. Taylor, J.B. Dahl, Does Naloxone Reinstatement Secondary Hyperalgesia in Humans after Resolution of a Burn Injury? A Placebo-Controlled, Double-Blind, Randomized, Cross-Over Study. *PloS One* 8,5 (2013)
 - K.L. Petersen, M.C. Rowbotham, Quantitative sensory testing scaled up for multicenter clinical research networks: A promising start. *Pain* (2006)
 - D. B. Pfau, E. K. Krumova, R.-D. Treede, R. Baron, T. Toelle, F. Birklein, W. Eich, C. Geber, A. Gerhardt, T. Weiss, W. Magerl, C. Maier: Quantitative sensory testing in the German Research Network on Neuropathic Pain (DFNS): Reference data for the trunk and application in patients with chronic postherpetic neuralgia. *Pain* 155 (2014), 1002–1015
 - C. Puta, B. Schulz, S. Schoeler, W. Magerl, B. Gabriel, H. Gabriel, W. Miltner, T. Weiss, Enhanced sensitivity to punctate painful stimuli in female patients with chronic low back pain. *BMC Neurology* 12:98 (2012)
 - C. Puta, B. Schulz, S. Schoeler, W. Magerl, B. Gabriel, H. Gabriel, W. Miltner, T. Weiss, Somatosensory Abnormalities for Painful and Innocuous Stimuli at the Back and at a Site Distinct from the Region of Pain in Chronic Back Pain Patients. *PloS One* 8,3 (2013)
 - T.K. Ringsted, C. Enghuss, M.A. Petersen, M.U. Werner, Demarcation of secondary hyperalgesia zones: Punctate stimulation pressure matters. *J Neurosci Methods* 256 (2015), 74-81

- B. Roessler, A. Paul, M. Schuch, M. Schulz, T. Sycha, B. Gustorff: Central origin of pinprick hyperalgesia adjacent to an UV-B induced inflammatory skin pain model in healthy volunteers. *JPain* 2 (2013), 40-45
- R. Rolke, W. Magerl, K.A. Campbell, C. Schalber, S. Caspari, F. Birklein F, R.-D. Treede: Quantitative sensory testing: a comprehensive protocol for clinical trials. *Eur J Pain* 10(1) (2006), 77-88
- R. Rolke, R. Baron, C. Maier, T.R. Tölle, R.-D. Treede, A. Beyer, A. Binder, N. Birbaumer, F. Birklein, I.C. Bötefür, S. Braune, H. Flor, V. Hüge, R. Klug, G.B. Landwehrmeyer, W. Magerl, C. Maihöfner, C. Rolko, C. Schaub, A. Scherens, T. Sprenger, M. Valet, B. Wasserka: Quantitative sensory testing in the German Research Network on Neuropathic Pain (DFNS): Standardized protocol and reference values. *Pain* 123 (2006), 231-243
- T. Schlereth, W. Magerl, R.D. Treede, Spatial discrimination thresholds for pain and touch in human hairy skin. *Pain* 92 (2001), 187-194
- S. Schuh-Hofer, R. Wodarski, D.B. Pfau, O. Caspani, W. Magerl, J.D. Kennedy, R.D. Treede: One night of total sleep deprivation promotes a state of generalized hyperalgesia: A surrogate pain model to study the relationship of insomnia and pain. *Pain* 154(9) (2013), 1613-1621
- P. Shabes, N. Schloss, W. Magerl, C. Schmahl, R.D. Treede, U. Baumgaertner, A novel human surrogate model of noninjurious sharp mechanical pain. *Pain* 157 (2016), 214-224
- A. Soni, R.N. Batra, S.E. Gwilym, T.D. Spector, D.J. Hart, N.K. Arden, C. Cooper, I. Tracey, M.K. Javaid: Neuropathic features of joint pain. *Arthritis Rheum* 65 (2013), 1942-1949
- K. Stiasny-Kolster, D.B. Pfau, W.H. Oertel, R.D. Treede, W. Magerl, Hyperalgesia and functional sensory loss in restless legs syndrome. *Pain* 154 (2013), 1457-1463
- E. van den Broeke, A. Mouraux, A. Groneberg, D.B. Pfau, RD Treede, T. Klein: Characterizing pinprick-evoked brain potentials before and after experimentally induced secondary hyperalgesia, *J Neurophysiol* 114 (2015), 2672-2681
- C. Vogel, R. Rukwied, L- Stockinger, M. Schley, M. Schmelz, W. Schleinzer, C. Konrad: Functional characterisation of at-level hypersensitivity in patients with spinal cord injury. *J Pain Vol* 18,1 (2017), 66-78
- G. Williams, L. Fabrizi, J. Meek, D. Jackson, I. Tracey, N. Robertson, R. Slater, M. Fitzgerald: Functional magnetic resonance imaging can be used to explore tactile and nociceptive processing in the infant brain. *Acta Pediatr* 104 (2015), 158-166
- E. A. Ziegler, W. Magerl, R. A. Meyer, R.-D. Treede: Secondary hyperalgesia to punctate mechanical stimuli. *Brain* 122 (1999), 2245-2257