

**1. Name:** PD Dr. Walter Magerl



Date of birth: 24th May 1956  
Gender: Male  
Marital status/children: Married / 1 child (born 1992) / Parental leave: none  
Address: Chair of Neurophysiology  
Center of Biomedicine and Medical Technology (CBTM)  
Medical Faculty Mannheim, Ruprecht-Karls-University Heidelberg  
Ludolf-Krehl-Str. 13-17  
68167 Mannheim  
Tel.: +49-621-383-9936, FAX: +49-621-383-9921  
E-mail: [walter.magerl@medma.uni-heidelberg.de](mailto:walter.magerl@medma.uni-heidelberg.de)  
Current position: Neurophysiology Group Leader (E15)  
Center for Biomedicine and Medical Technology Mannheim (CBTM)  
Medical Faculty Mannheim, Ruprecht-Karls-University Heidelberg

## 2. Education

04/1987 – 03/1989 Study of Medicine at the University Erlangen-Nürnberg  
10/1986 – 02/1992 PhD thesis project at the Institute of Physiology and Experimental Pathophysiology, University Erlangen-Nürnberg  
09/1984 – 07/1986 Diploma thesis project at the Department of Physiology, University Heidelberg  
10/1977 – 09/1984 Study of Psychology at the University Heidelberg

## 3. Scientific certificates

02/2005 Habilitation university teaching qualification (venia legendi) for Physiology, Dr. med. habil. degree, University Mainz  
02/1992 Dr. rer. biol. hum. degree (equivalent to PhD), University Erlangen-Nürnberg  
03/1989 Preclinical Medical Examination (Physikum), University Erlangen-Nürnberg  
07/1986 Dipl. Psych. degree, University Heidelberg

## 4. Professional functions

since 03/2008 Group leader (E15), Center of Biomedicine and Medical Technology Mannheim, Chair of Neurophysiology, Medical Faculty Mannheim, University of Heidelberg  
03/1999 – 02/2008 Research assistant (BAT II, E13), Institute of Physiology and Pathophysiology, Johannes Gutenberg University Mainz  
03/1993 – 02/1999 Hochschulassistent (assistant professor C1), Institute of Physiology and Pathophysiology, Johannes Gutenberg University Mainz;  
03/1992 – 02/1993 Research scientist, Center of excellence (Sonderforschungsbereich) SFB 353 „Pathobiology of pain generation and pain processing“, University Erlangen-Nürnberg  
10/1986 – 02/1992 PhD student at the Department of Physiology, University Erlangen-Nürnberg

## 5. Miscellaneous

### Research interests

Psychophysical methods, quantitative sensory testing (QST), plasticity of the nociceptive system, long-term potentiation and long-term depression, metaplasticity, mechanisms of central sensitization, hyperalgesia and allodynia, neurogenic inflammation, neuropathic pain, pain genetics, endogenous opioids and cannabinoids, hormones, sleep

### Membership

German Physiological Society (Deutsche Physiologische Gesellschaft DPG, since 1993) International Association for the Study of Pain (IASP, since 1990); Special Interest Group Neuropathic Pain of IASP (NeuPSIG, since 2002); Special Interest Group Acute Pain of IASP (APSIG, since 2005); German Chapter of IASP (Deutsche Gesellschaft zum Studium des Schmerzes DGSS, since 2000; Head Scientific Education 2008-2013, Member Research Committee from 10/2010)

### Journals

European Journal of Pain (Associate editor, since 2008)

### Honors and awards

- 1995 Award of the American Autonomic Society (AAS)
- 1998 Society for Neuroscience Award - Satellite "Spinal cord plasticity"
- 2001 German Pain Research Award (Basic science)
- 2003 German Pain Research Award (Clinical science; as a coauthor of the awardees)
- 2005 German Pain Research Award (Clinical science; as a coauthor of the awardees)
- 2009 German Pain Research Award (Clinical science; as a coauthor of the awardees)

### Patents

DE/10.07.03/DEA10331250

US/28.07.03/USP490865

### Grant support (last 5 years)

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|--------------------------|--|-----------------|
| DFG: Tr 236/16-1&2       | "Heterosynaptic long-term potentiation in the spinal cord as a mechanism of neurogenic hyperalgesia."  | 07/2003-04/2007 |
| IASP Collaborating Grant | "Quantitative Sensory Testing (QST) in orofacial tissue"   | 04/2007-05/2009 |
| DFG: Ma1251/9-1          | (FOR926/SP5) "The role of endocannabinoids in human pain perception, habituation of pain perception and prevention/reversal of pain plasticity (implicit pain memory)"   | 03/2008-02/2011 |
| BMBF-LOGIN               | (LOGIN/SP4) "Contribution of soft deep tissue to low-back pain in humans" as part of the research consortium "Localized and generalized musculoskeletal pain: psychobiological mechanisms and implications of treatment" | 03/2011-02/2014 |
| DFG: Ma1251/9-2          | (FOR926/SP5) "Role of endocannabinoid systems in human pain sensitivity, pain plasticity, pain habituation and neurogenic and non-neurogenic inflammation"   | 05/2011-04/2014 |

## 6. Publications

Total number of publications: 82

Publications in: *Ann. Neurol.* (1), *Brain* (3), *Eur J Pain* (4), *J. Neurosci* (1), *J. Neurophysiol* (2), *NeuroImage* (4), *Neurology* (1), *Pain* (21) and others.

### Original articles since 2002

18. Baumgärtner U, Magerl W, Klein T, Hopf HC, Treede RD (2002) Neurogenic hyperalgesia versus painful hypoalgesia: two distinct mechanisms of neuropathic pain. *Pain* 96:141-151

19. Jung P, Baumgärtner U, Bauermann T, Magerl W, Gawehn J, Stoeter P, Treede RD (2003) Asymmetry in the human primary somatosensory cortex and handedness. *Neuroimage* 19:913-923
20. Schlereth T, Baumgärtner U, Magerl W, Stoeter P, Treede RD (2003) Left-hemisphere dominance in early nociceptive processing in the human parasylvian cortex. *NeuroImage* 20:441-454
21. Greffrath W, Magerl W, Disque-Kaiser U, Martin E, Reuss S, Boehmer G (2004) Contribution of  $Ca^{2+}$ -activated  $K^+$  channels to hyperpolarizing after-potentials and discharge pattern in rat supra-optic neurones. *J.Neuroendocrinol.* 16:577-588
22. Klein T, Magerl W, Hopf HC, Sandkühler J, Treede RD (2004) Perceptual correlates of nociceptive long-term potentiation and long-term depression in humans. *J.Neurosci.* 24:964-971
23. Magerl W, Treede RD (2004) Secondary tactile hypoesthesia: a novel type of pain-induced somatosensory plasticity in human subjects. *Neurosci.Lett.* 361:136-139
24. Schmahl C, Greffrath W, Baumgärtner U, Schlereth T, Magerl W, Philipsen A, Lieb K, Bohus M, Treede RD (2004) Differential nociceptive deficits in patients with borderline personality disorder and self-injurious behavior: laser-evoked potentials, spatial discrimination of noxious stimuli, and pain ratings. *Pain* 110:470-479
25. Stiasny-Kolster K, Magerl W, Oertel WH, Möller JC, Treeden RD (2004) Static mechanical hyperalgesia without dynamic tactile allodynia in patients with restless legs syndrome. *Brain* 127:773-782
26. Ashina S, Babenko L, Jensen R, Ashina M, Magerl W, Bendtsen L (2005) Increased muscular and cutaneous pain sensitivity in cephalic region in patients with chronic tension-type headache. *Eur.J.Neurol.* 12:543-549
27. Rolke R, Campbell K, Andrews, Magerl W, Treede RD (2005) Deep pain thresholds in the distal limbs of healthy human subjects. *Eur.J.Pain* 9:39-48
28. Ashina S, Bendtsen L, Ashina M, Magerl W, Jensen R (2006) Generalized hyperalgesia in patients with chronic tension-type headache. *Cephalalgia* 26:940-948
29. Baumgärtner U, Buchholz HG, Bellosevich A, Magerl W, Siessmeier T, Rolke R, Höhnemann S, Piel M, Rösch F, Wester HJ, Henriksen G, Stoeter P, Bartenstein P, Treede RD, Schreckenberger M (2006) High opiate receptor binding potential in the human lateral pain system. *NeuroImage* 30:692-699
30. Rolke R, Magerl W, Andrews-Campbell K, Schalber C, Caspar S, Birklein F, Treede RD (2006) Quantitative sensory testing: a comprehensive protocol for clinical trials. *Eur.J.Pain* 10:77-88
31. Rolke R, Baron R, Maier C, Tolle TR, Treede RD, Beyer A, Binder A, Birbaumer N, Birklein F, Botefür IC, Braune S, Flor H, Hüge V, Klug R, Landwehrmeyer GB, Magerl W, Maihofner C, Rolko C, Schaub C, Scherens A, Sprenger T, Valet M, Wasserka B (2006) Quantitative sensory testing in the German Research Network on Neuropathic Pain (DFNS): standardized protocol and reference values. *Pain* 123:231-243.
32. Klein T, Magerl W, Treede RD (2006) Perceptual correlate of nociceptive long-term potentiation (LTP) in humans shares the time course of early-LTP *J Neurophysiol* 96:3551-3555.
33. Klein T, Magerl W, Nickel U, Hopf HC, Sandkühler J, Treede RD (2007) Effects of the NMDA-receptor antagonist ketamine on perceptual correlates of long-term potentiation within the nociceptive system. *Neuropharmacology* 52:655-661.
34. Hansen N, Klein T, Magerl W, Treede RD (2007) Psychophysical evidence for long-term potentiation of C-fiber and Delta-fiber pathways in humans by analysis of pain descriptors. *J Neurophysiol* 97:2559-2563
35. Lang S, Klein T, Magerl W, Treede RD (2007) Modality-specific sensory changes in humans after the induction of long-term potentiation (LTP) in cutaneous nociceptive pathways. *Pain* 128:254-263
36. Klein T, Magerl W, Hanschmann A, Althaus M, Treede RD (2008) Antihyperalgesic and analgesic properties of the N-methyl-D-aspartate (NMDA) receptor antagonist neramexane in a human surrogate model of neurogenic hyperalgesia. *Eur J Pain* 12:17-29

37. Birklein F, Depmeier C, Rolke R, Hansen C, Rautenstrauss B, Prawitt D, Magerl W (2008) A family-based investigation of cold pain tolerance *Pain* 138:111-118
38. Geber C, Magerl W, Fondel R, Fechir M, Rolke R, Vogt T, Treede RD, Birklein F (2008) Numbness in clinical and experimental pain--a cross-sectional study exploring the mechanisms of reduced tactile function. *Pain* 139:73-81
39. Klein T, Stahn S, Magerl W, Treede RD (2008) Evidence for heterosynaptic facilitation at the site of long-term potentiation (LTP) in cutaneous nociceptive pathways in humans. *Pain* 139:507-519
40. Huge V, Lauchart M, Förderreuther S, Kaufhold W, Valet M, Azad SC, Beyer A, Magerl W (2008) Interaction of hyperalgesia and sensory loss in complex regional pain syndrome type I (CRPS I). *PLoSOne* 3:e2742
41. Jung P, Baumgärtner U, Magerl W, Treede RD (2008) Hemispheric asymmetry of hand representation in human primary somatosensory cortex and handedness. *Clin Neurophysiol.* 119:2579-2786
42. Klauenberg S, Maier C, Assion HJ, Hoffmann A, Krumova EK, Magerl W, Scherens A, Treede RD, Juckel G (2008) Depression and changed pain perception: hints for a central disinhibition mechanism. *Pain* 140:332-343
43. Ludäscher P, Greffrath W, Schmahl C, Kleindienst N, Kraus A, Baumgärtner U, Magerl W, Treede RD, Bohus M (2009) A cross-sectional investigation of discontinuation of self-injury and normalizing pain perception in patients with borderline personality disorder. *Acta Psychiatr Scand.* 120:62-70
44. Eberle T, Doganci B, Krämer HH, Geber C, Fechir M, Magerl W, Birklein F (2009) Warm and cold complex regional pain syndromes: differences beyond skin temperature? *Neurology.* 72:505-512
45. Jantsch HH, Gawlitza M, Geber C, Baumgärtner U, Krämer HH, Magerl W, Treede RD, Birklein F (2009) Explicit episodic memory for sensory-discriminative components of capsaicin-induced pain: immediate and delayed ratings. *Pain.* 143:97-105
46. Mueller C, Klega A, Buchholz HG, Rolke R, Magerl W, Schirrmacher R, Schirrmacher E, Birklein F, Treede RD, Schreckenberger M (2010) Basal opioid receptor binding is associated with differences in sensory perception in healthy human subjects: a [18F]diprenorphine PET study. *NeuroImage.* 49:731-737.
47. Huge V, Lauchart M, Magerl W, Schelling G, Beyer A, Thieme D, Azad SC (2010) Effects of low-dose intranasal (S)-ketamine in patients with neuropathic pain. *Eur J Pain.* 14:387-394.
48. Tiede W, Magerl W, Baumgärtner U, Durrer B, Ehler U, Treede RD (2010) Sleep restriction attenuates amplitudes and attentional modulation of pain-related evoked potentials, but augments pain ratings in healthy volunteers. *Pain.* 148:36-42.
49. Blankenburg M, Boekens H, Hechler T, Maier C, Krumova E, Scherens A, Magerl W, Aksu F, Zernikow B (2010) Reference values for quantitative sensory testing in children and adolescents: developmental and gender differences of somatosensory perception. *Pain.* 149:76-88
50. Maier C, Baron R, Tölle TR, Binder A, Birbaumer N, Birklein F, Gierthmühlen J, Flor H, Geber C, Huge V, Krumova EK, Landwehrmeyer GB, Magerl W, Maihöfner C, Richter H, Rolke R, Scherens A, Schwarz A, Sommer C, Tronnier V, Uçeyler N, Valet M, Wasner G, Treede RD (2010) Quantitative sensory testing in the German Research Network on Neuropathic Pain (DFNS): Somatosensory abnormalities in 1236 patients with different neuropathic pain syndromes. *Pain.* 150: 439-450.
51. Blankenburg M, Boekens H, Hechler T, Maier C, Krumova E, Scherens A, Magerl W, Aksu F, Zernikow B (2010) Quantitative Sensorische Testung bei Kindern und Jugendlichen nach dem Protokoll des Deutschen Forschungsverbundes Neuropathischer Schmerz (DFNS) Alters- und Geschlechtsunterschiede der Referenzwerte. *Schmerz* 24:380-382
52. Bachmann CG, Muschinsky S, Nitsche MA, Rolke R, Magerl W, Treede RD, Paulus W, Happe S (2010) Transcranial direct current stimulation of the motor cortex induces distinct changes in thermal and mechanical sensory percepts. *Clin Neurophysiol.* 121:2083-2089

53. Magerl W, Krumova EK, Baron R, Tölle T, Treede RD, Maier C (2010) Reference data for quantitative sensory testing (QST): refined stratification for age and a novel method for statistical comparison of group data. *Pain*. 151:598-605
54. Binder A, May D, Baron B, Maier C, Tölle TR, Treede R-D, Berthele A, Faltraco A, Flor H, Gierthmühlen J, Haenisch S, Hüge V, Magerl W, Maihöfner C, Richter H, Rolke R, Scherens A, Üçeyler N, Ufer M, Wasner G, Zhu J, Cascorbi I (2011) Transient receptor potential channel polymorphisms are associated with the somatosensory function in neuropathic pain patients. *PLoS One* 6: e17387
55. Hüge V, Lauchart M, Magerl W, Beyer A, Moehle P, Kaufhold W, Schelling G, Azad SC (2011) Complex Interaction of Sensory and Motor Signs and Symptoms in Chronic CRPS. *PLoS One* 6: e18775
56. Pfau DB, Klein T, Putzer, D, Pogatzki-Zahn E, Treede RD, Magerl W (2011) Analysis of hyperalgesia time courses in humans following painful electrical high-frequency stimulation identifies a possible transition from early to late LTP-like pain plasticity. *Pain*. (in press)
57. Fißmer I, Klein T, Magerl W, Treede RD, Zahn PK, Pogatzki-Zahn EM (2011) Modality-specific somatosensory changes in a human surrogate model of postoperative pain. *Anesthesiology* (in press)

#### Reviews and book chapters

14. Treede RD, Rolke R, Andrews K, Magerl W (2002) Pain elicited by blunt pressure: neurobiological basis and clinical relevance. *Pain* 98:235-240
15. Treede RD, Rolke R, Magerl W (2003) Reply to letter by Cohen and Quintner. *Pain* 104:712-714
16. Treede RD Magerl W (2003) Zentrale nozizeptive Neurone und Bahnen. In: *Handbuch Chronischer Schmerz*, edited by U. T. Egle, S. O. Hoffmann, K. A. Lehmann, and W. A. Nix, Stuttgart, Schattauer, pp. 34-44.
17. Klein T, Magerl W, Mantzke U, Hopf HC, Sandkühler J, Treede RD (2003) Perceptual correlates of long-term potentiation in the spinal cord. In: *Proceedings of the 10th World Congress on Pain. Progress in Pain Research and Management, Vol. 24*, edited by J. Dostrovsky, D. Carr, and M. Koltzenburg, Seattle, IASP Press, Seattle, pp. 407-415.
18. Treede RD, Handwerker HO, Baumgärtner U, Meyer RA, Magerl W (2004) Hyperalgesia and allodynia: taxonomy, assessment, and mechanisms. In: *Hyperalgesia: Molecular Mechanisms and Clinical Implications*, edited by K. Brune and H. O. Handwerker, Seattle, IASP Press, pp. 1-15.
19. Klein T, Magerl W, Rolke R, Treede RD (2005) Human surrogate models of neuropathic pain. *Pain* 115:227-233
20. Treede RD, Klein T, Magerl W (2006) Pain memory and central sensitization in humans. In: Flor H, Kalso E, Dostrovsky JO (eds) *Proceedings of the 11th World Congress on Pain, Seattle, IASP Press*, pp. 251-267.
21. Rolke R, Birklein F, Magerl W, Treede RD (2006) Schmerz: Physiologische Grundlagen und klinische Aspekte. *Quintessenz* 57:983-990.
22. Magerl W, Klein T (2006) Experimental human models of neuropathic pain. In: *Aminoff MJ, Boller F, Schwab DF (Eds.) Handbook of Clinical Neurology., Vol. 81 Pain*, edited by F. Cervero F, T.S. Jensen, Elsevier, Edinburgh, pp. 503-516.
23. Klein T, Magerl W, Treede RD (2007) Forget about your chronic pain. *Pain* 132:16-17
24. Klein T, Magerl W, Treede RD, Pogatzki-Zahn E (2008) Pain memory and central sensitization in humans. In: Pogatzki-Zahn E, Zahn P, van Aken (eds) *Postoperative Schmerztherapie, Stuttgart, Thieme*, pp. 7-25.
25. Magerl W, Treede RD (2011) Physiologie von Nozizeption und Schmerz. In: Kröner-Herwig B, Frettlöh J, Klinger R, Nilges P (Eds.) *Schmerzpsychotherapie, Heidelberg, Springer 2011*, pp. 29-75.