



## 1. Curriculum Vitae

**Title** Univ.-Prof. Dr. rer. nat.  
**Name** Spehr, Marc  
**Position** Lichtenberg-Professor for Chemosensation  
**ORCID** 0000-0001-6616-4196  
**Date of birth / age** August 7<sup>th</sup> 1973  
**Institution** RWTH Aachen University  
Institute for Biology II  
Dept. Chemosensation  
2. Sammelbau Biologie, Room 1.109  
Worringerweg 3, D-52074 Aachen  
**Contact** phone: +49 (0)241 / 80-20802  
fax: +49 (0)241 / 80-22133  
**E-mail** [m.spehr@sensorik.rwth-aachen.de](mailto:m.spehr@sensorik.rwth-aachen.de)  
**Webpage** <http://www.sensorik.rwth-aachen.de/>

### **Education / Qualification**

Diploma (Biology)	April 1999	Lehrstuhl für Zellphysiologie, Ruhr-University Bochum
Doktor <i>rer. nat.</i>	Dec. 2002	Lehrstuhl für Zellphysiologie, Ruhr-University Bochum ( <i>summa cum laude</i> )

### **Appointments**

04/2014 – present Lichtenberg-Professor (Full Professor, W3) for Chemosensation, Department of Biology II, RWTH Aachen University

04/2009 – 03/2014 Lichtenberg-Professor (Associate Professor, W2, tenure track) for Chemosensation, Department of Biology II, RWTH Aachen University

04/2006 – 03/2009 Independent Research Group Leader (DFG Emmy Noether-Program), Research Group *Chemosensory Mechanisms of Social Communication*, Department of Cellular Physiology, Ruhr-University Bochum

01/2004 – 03/2006 Postdoctoral fellow, Department of Anatomy and Neurobiology, School of Medicine, University of Maryland, Baltimore, MD, USA

01/2003 – 12/2003 Postdoctoral fellow, Department of Cellular Physiology, Ruhr-University Bochum

### **Awards**

2019 Best Teaching Award (1<sup>st</sup> place; 5,000 €), Biology Students' Council, RWTH Aachen University

2018 Best Teaching Award (1<sup>st</sup> place; 5,000 €), Biology Students' Council, RWTH Aachen University

2016 Member of the *FENS Kavli Network of Excellence*, sponsored by the Federation of European Neuroscience Societies and the Kavli Foundation



- 2014 Best Teaching Award (1<sup>st</sup> place; 5,000 €), Biology Students' Council, RWTH Aachen University
- 2013 Offer (*primo loco*) to become the chair of Animal Physiology at University of Potsdam
- 2013 Best Teaching Award (3<sup>rd</sup> place; 2,000 €), Biology Students' Council, RWTH Aachen University
- 2012 Best Teaching Award (3<sup>rd</sup> place; 2,000 €), Biology Students' Council, RWTH Aachen University
- 2010 *AChemS Young Investigator Award for Research in Olfaction*, 32<sup>nd</sup> annual meeting of the Association for Chemoreception Sciences (AChemS), St. Petersburg, FL
- 2009 Lichtenberg-Professorship for Chemosensation, VolkswagenFoundation
- 2008 Member of the *Young Academy (Junges Kolleg)* of the Academy of Arts and Sciences of the federal state North Rhine-Westphalia
- 2008 *poster award*, 87<sup>th</sup> annual meeting of the German Physiological Society in Cologne
- 2006 *Emmy Noether-Research Group*, Deutsche Forschungsgemeinschaft
- 2004 *Emmy Noether Fellowship*, Deutsche Forschungsgemeinschaft
- 2004 *Dr-Heinrich-Kost-Award* for the year's best dissertation, Ruhr-University Bochum
- 2003 *von Skramlik Award* for outstanding achievements of a junior scientist in the chemical senses, 3<sup>rd</sup> Olfactory Bioresponse Meeting, Dresden

#### **Active member of the following scientific societies**

Society for Neuroscience (SfN)	Neurowissenschaftliche Gesellschaft (NWG)
European Chemoreception Research Organization (ECRO)	Association for Chemoreception Sciences (AChemS)

#### **Referee activity**

*Reviewer for the following scientific journals:*

ACS Chemical Biology	Journal of Comparative Physiology
American Journal of Physiology	Journal of Experimental Biology
Biological Chemistry	Journal of Neurochemistry
BMC Neuroscience	Journal of Neuroendocrinology
Cell and Tissue Research	Journal of Neuroscience
Cellular and Molecular Life Sciences	Journal of Visualized Experiments (JoVE)
Chemical Senses	Neural Regeneration Research
Current Biology	Nature Communications
Developmental Biology	Reproduction
EMBO Journal	Open Biology
eNeuro	Physiological Reviews
European Journal of Neuroscience	PLoS one
Frontiers in Neuroscience	Proceedings of the National Academy of Sciences (PNAS)
FASEB Journal	Scientific Reports
Human Reproduction	
Journal of Cell Science	
Journal of Cellular Physiology	

*Reviewer for the following funding organizations:*

National Science Foundation (NSF)  
Deutsche Forschungsgemeinschaft (DFG)  
French National Research Agency (ANR)  
German Israeli Foundation (GIF)  
Israel Science Foundation (ISF)

Minerva Foundation  
Leibniz-Gemeinschaft  
Boehringer Ingelheim Fonds  
U.S.-Israel Binational Science Foundation  
Studienstiftung des deutschen Volkes

## 2. Publications

**2001 – today** (ISI WoS)

articles (peer-reviewed): **65**

first author: **14** / senior author: **17**

impact points (cumulative / per study):

- total: **492.7 / 8.1**
- as first / senior author: **213.8 / 7.3**
- as coauthor: **278.9 / 8.3**

total citations: **2,833**

total citations (without self-citations): **2,675**

citing articles: **2,088**

citations per article: **43.2**

*h*-index: **26**

### Original studies:

#### 2020

1. Fleck D, Kenzler L, Mundt N, Strauch M, Uesaka N, Moosmann R, Bruentgens F, Missel A, Mayerhofer A, Merhof D, Spehr J, **Spehr M** (2020) ATP activation of peritubular cells drives testicular sperm transport. *bioRxiv* doi: <https://doi.org/10.1101/2020.09.15.298299>.
2. Kostka JK, Gretenkord S, **Spehr M**, Hanganu-Opatz IL (2020) Bursting mitral cells time the oscillatory coupling between olfactory bulb and entorhinal networks in neonatal mice. *The Journal of Physiology*, in print. IF: 4.5
3. Tsitoura C, Malinowski S, Mohrhardt J, Degen R, Di Benedictis BT, Gao Y, Watznauer K, Gerhold K, Nagel M, Weber M, Rothermel M, Hanganu-Opatz IL, Ben-Shaul Y, Davison I, **Spehr M** (2020) Synchronous infra-slow oscillations organize ensembles of accessory olfactory bulb projection neurons into distinct microcircuits. *The Journal of Neuroscience* 40: 4203–4218. IF: 7.9
4. Switacz VK, Wypysek SK, Degen R, Crassous JJ, **Spehr M**<sup>§</sup>, Richter W<sup>§</sup> (2020) Influence of size and cross-linking density of microgels on cellular uptake and uptake kinetics. *Biomacromolecules*, in print. <sup>§</sup>*shared senior authorship* IF: 5.7
5. Hahn A, Pensold D, Bayer C, Tittelmeier J, Gonzalez-Bermudez L, Marx-Blümel L, Linde J, Groß J, Salinas-Riester G, Lingner T, von Maltzahn J, **Spehr M**, Pieler T, Urbach A, Zimmer-Bensch G (2020) DNA methyltransferase 1 (DNMT1) function is implicated in the age-related loss of cortical interneurons. *Frontiers Cell and Developmental Biology* 8: 639. doi: 10.3389/fcell.2020.00639. IF: 5.2

#### 2019

6. Puelles VG, Fleck D, Ortiz L, Papadouri S, Strieder T, Boehner A, van der Wolde JW, Vogt M, Saritas T, Kuppe C, Fuss A, Menzel S, Klinkhammer BM, Müller-Newen G, Heymann F, Decker L, Braun F, Kretz O, Huber TB, Susaki EA, Ueda HR, Boor P, Floege J,

- Kramann R, Kurts C, Bertram JF, **Spehr M**, Nikolic-Paterson DJ, Moeller MJ (2019) Novel 3D analysis using optical tissue clearing documents the evolution of murine rapidly progressive glomerulonephritis. ***Kidney International*** 96: 505-516. IF: 8.4
7. Ardila-Fierro KJ, Pich A, **Spehr M**, Hernández JG, Bolm C (2019) Synthesis of acylglycerol derivatives by mechanochemistry. ***Beilstein Journal of Organic Chemistry*** 15, 811–817. IF: 2.3
8. Marom K, Horesh N, Abu-Snieneh A, Dafni A, Paul R, Fleck D, **Spehr M**, Ben-Shau YI (2019) The vomeronasal system can mediate novel stimulus response pairings. ***Cell Reports*** 27: 676-684. IF: 8.0
9. Gretenkord S, Kostka JK, Hartung H, Watznauer K, Fleck D, Minier-Toribio A, **Spehr M**, Hanganu-Opatz IL (2019) Coordinated electrical activity in the olfactory bulb gates the oscillatory entrainment of entorhinal networks in neonatal mice. ***PLoS Biology*** 17: e2006994. IF: 9.2

## 2018

10. Wong WM, Nagel M, Hernandez-Clavijo A, Pifferi S, Menini A<sup>§</sup>, **Spehr M**<sup>§</sup>, Meeks JP<sup>§</sup> (2018) Sensory Adaptation to Chemical Cues by Vomeronasal Sensory Neurons. ***eNeuro*** <https://doi.org/10.1523/ENEURO.0223-18.2018>. <sup>§</sup>*shared senior authorship* IF: 3.5
11. Mundt N, **Spehr M**, Lishko PV (2018) TRPV4 is the temperature-sensitive ion channel of human sperm. ***eLIFE*** 7:e35853. IF: 7.6
12. Walenta L, Fleck D, Fröhlich I, von Eysmond H, Arnold G, Spehr J, Schwarzer JU, Köhn F-M, **Spehr M**, Mayerhofer A (2018) ATP-mediated Events in Peritubular Cells Contribute to Sterile Testicular Inflammation. ***Scientific Reports*** 8: 1431. IF: 4.8
13. Pelz T, Drose DR, Fleck D, Henkel B, Ackels T, **Spehr M**, Neuhaus EM (2018) An ancestral TMEM16 homolog from *Dictyostelium discoideum* forms a scramblase. ***PLOS ONE*** 13:e0191219. IF: 3.1

## 2017

14. Unger J, Mansour M, Kopazka M, Gronloh N, **Spehr M**, Merhof D. An Unsupervised Learning Approach for Tracking Mice in an Enclosed Area. ***BMC Bioinformatics*** 18(1): 272. IF: 2.4
15. Wallbrecher R, Ackels T, Olea RA, Klein MJ, Caillon L, Schiller J, Bove-Geurts PH, van Kuppevelt TH, Ulrich AS, **Spehr M**, Adjobo-Hermans MJW, Brock R (2017) Membrane permeation of arginine-rich cell-penetrating peptides independent of transmembrane potential as a function of lipid composition and membrane fluidity. ***Journal of Controlled Release*** 256: 68–78. IF: 7.7
16. Henkel B, Bintig W, Bhat S, **Spehr M**, Neuhaus EM (2016) NHERF1 in Microvilli of Vomeronasal Sensory Neurons. ***Chemical Senses*** 42: 25-35. IF: 3.9

## 2016

17. Fleck D, Mundt N, Bruentgens F, Geilenkirchen P, A Machado P, Veitinger T, Veitinger S, Engelhardt CH, Oldiges M, Spehr J, **Spehr M** (2016) Distinct purinergic signaling pathways in prepubescent mouse spermatogonia. ***The Journal of General Physiology*** 148: 253-271. IF: 4.8

18. Untiet V, Moeller LM, Ibarra-Soria X, Sánchez-Andrade G, Stricker M, Neuhaus EM, Logan DW, Gensch T, **Spehr M** (2016) Elevated cytosolic Cl<sup>-</sup> concentrations in dendritic knobs of mouse vomeronasal sensory neurons. *Chemical Senses* 41: 669-676. IF: 3.9
19. Gorin M, Tsitoura C, Kahan A, Watznauer K, Drose DR, Arts M, Mathar R, O'Connor S, Hanganu-Opatz IL, Ben-Shaul Y, **Spehr M** (2016) Interdependent conductances drive infra-slow intrinsic rhythmogenesis in a subset of accessory olfactory bulb projection neurons. *The Journal of Neuroscience* 36: 3127–3144. IF: 7.9
20. Arts M, Cordts M, Gorin M, **Spehr M**, Mathar R (2016) A Discontinuous Neural Network for Non-Negative Sparse Approximation. Open Access E-Print. *arXiv*: 1603.06353.
21. Ackels T, Drose DR, **Spehr M** (2016) In-depth physiological analysis of defined cell populations in acute tissue slices of the mouse vomeronasal organ. *The Journal of Visualized Experiments* 115: doi 10.3791/54517. IF: 1.3
22. Gamper I, Fleck D, Barlin M, **Spehr M**, El Sayad S, Kleine H, Maxeiner S, Schalla C, Aydin G, Hoss M, Litchfield DW, Lüscher B, Zenke M, Sechi A (2016) GAR22 $\beta$  regulates cell migration, sperm motility and axoneme structure. *Molecular Biology of the Cell* 27: 277-294. IF: 4.8

## 2015

23. von Bohl A, Kuehn A, Simon N, Nkwouano Ngongang V, **Spehr M**, Baumeister S, Przyborski JM, Fischer R, Pradel G (2015) A WD40-repeat protein unique to malaria parasites associates with adhesion protein complexes and is crucial for blood stage progeny. *Malaria Journal* 14: 435. doi: 10.1186/s12936-015-0967-x. IF: 3.4
24. Oberland S, Ackels T, Gaab S, Pelz T, Spehr J, **Spehr M**, Neuhaus EM (2015) CD36 is involved in oleic acid detection by the murine olfactory system. *Front. Cell. Neurosci.* 9: 366. doi: 10.3389/fncel.2015.00366. IF: 4.3
25. Bitzenhofer SH, Sieben K, Siebert KD, **Spehr M**, Hanganu-Opatz IL (2015) Oscillatory activity in developing prefrontal networks results from theta-gamma modulated synaptic inputs. *Cell Reports* 3: 486-497. IF: 8.0
26. Cichy A, Ackels T, Tsitoura C, Kahan A, Gronloh N, Söchtig M, Engelhardt CH, Ben-Shaul Y, Müller F, Spehr J, **Spehr M** (2015) Extracellular pH regulates excitability of vomeronasal sensory neurons. *The Journal of Neuroscience* 35: 4025-4039. IF: 7.9

## 2014

27. Henkel B, Drose D, Ackels T, Oberland S, **Spehr M**, Neuhaus EM (2014) Coexpression of Anoctamins in cilia of olfactory sensory neurons. *Chemical Senses* 40: 73-87. IF: 3.9
28. Ackels T, von der Weid B, Rodriguez I, **Spehr M** (2014) Physiological characterization of formyl peptide receptor expressing cells in the mouse vomeronasal organ. *Front. Neuroanat.* 8: 134. doi: 10.3389/fnana.2014.00134. IF: 4.2
29. Baumgart S, Jansen F, Bintig W, Kalbe B, Herrmann C, Klumpers F, Köster SD, Scholz P, Rasche S, Dooley R, Metzler-Nolte N, **Spehr M**, Hatt H, Neuhaus EM (2014) Scaffolding by MUPP1 regulates odorant-mediated signaling in olfactory sensory neurons. *Journal of Cell Science* 127: 2518-2527. IF: 6.4
30. Kaur AW, Ackels T, Kuo T-H, Cichy A, Dey S, Hays C, Kateri M, Logan DW, Marton TF, **Spehr M**, Stowers L (2014) Murine Pheromone Proteins Constitute a Context-Dependent Combinatorial Code Governing Multiple Social Behaviors. *Cell* 157: 676-688. IF: 34.4



## 2013

31. Ferrero DM, Moeller LM, Osakada T, Horio N, Li Q, Roy DS, Cichy A, **Spehr M**, Touhara K, Liberles SD (2013) A juvenile mouse pheromone inhibits sexual behavior through the vomeronasal system. *Nature* 502: 368-371. IF: 41.6
32. Dietzel E, Wessling J, Floehr J, Schäfer C, Ensslen S, Denecke B, Rösing B, Neulen J, Veitinger T, **Spehr M**, Tropartz T, Tolba R, Renne R, Schorle H, Gottenbusch Y, Hildebrand A, Stöcker W, Weiskirchen R, Jahnen-Dechent W (2013) Fetuin-B, a liver-derived plasma protein is essential for fertilization. *Developmental Cell* 25: 106-112. IF: 9.6
33. Hartmann C, Triller A, **Spehr M**, Dittrich R, Hatt H, Buettner A (2013) Sperm-Activating Odorous Substances in Human Follicular Fluid and Vaginal Secretion: Identification by Gas Chromatography–Olfactometry and Ca<sup>2+</sup> Imaging. *ChemPlusChem* 78: 695-702. IF: 1.7
34. Arts M, Corroy S, Gorin M, **Spehr M**, Schmeink A, Mathar R (2013) Modeling Biological Systems using a Parallel Quantized MIMO Channel. Modeling Biological Systems using a Parallel Quantized MIMO Channel. Proceedings: *The Tenth International Symposium on Wireless Communication Systems (ISWCS 2013)*, Ilmenau, Germany. IF: n/a

## 2010 – 2012

35. Fluegge D, Moeller LM, Cichy A, Gorin M, Weth A, Veitinger S, Lohmer S, Corrazza S, Neuhaus EM, Baumgartner W, Spehr J, **Spehr M** (2012) Mitochondrial Ca<sup>2+</sup> mobilization is a key element in olfactory signaling. *Nature Neuroscience* 15: 754-762. IF: 19.9
36. Veitinger S, Veitinger T, Cainarca S, Fluegge D, Engelhardt CH, Lohmer S, Hatt H, Corrazza S, Spehr J, Neuhaus EM, **Spehr M** (2011) Mitochondrial Ca<sup>2+</sup> Mobilization in Purinergic Mouse Sertoli Cell Signaling. *Journal of Physiology* 589: 5033–5055. IF: 4.8
37. Ferrero DM, Lemon JK, Fluegge D, Pashkovski SL, Korzan WJ, Datta SR, **Spehr M**, Fendt M, Liberles SD (2011) Detection and avoidance of a carnivore odor by prey. *PNAS* 108: 11235-11240. IF: 9.5
38. Veitinger T, Riffell JR, Veitinger S, Nascimento JM, Armon L, Triller A, Chandsawangbhuwana C, Schwane K, Geerts A, Wunder F, Berns MW, Neuhaus EM, Eisenbach M, Zimmer RK, **Spehr M**<sup>§</sup>, Hatt H (2011) Chemosensory Ca<sup>2+</sup> Dynamics Correlate with Diverse Behavioral Phenotypes in Human Sperm. *Journal of Biological Chemistry* 286: 17311-17325. <sup>§shared senior authorship</sup> IF: 4.0
39. Spehr J, Gelis L, Osterloh M, Oberland S, Hatt H, **Spehr M**, Neuhaus EM (2011) G-protein-coupled receptor signaling via Src kinase induces endogenous human transient receptor potential vanilloid type 6 (TRPV6) channel activation. *Journal of Biological Chemistry* 286: 13184-13192. IF: 4.0
40. Bieda R, Dobroschke M, Triller A, Ott I, **Spehr M**, Gust R, Prokop A, Sheldrick WS (2010) Cell-selective, apoptosis-inducing rhodium(III) crown thiaether complexes. *ChemMedChem* 5: 1123-1133. IF: 3.1

## 2006 – 2009

41. Rivière S, Challet L, Fluegge D, **Spehr M**, Rodriguez I (2009) Formyl peptide receptor-like proteins are a novel family of vomeronasal chemosensors. *Nature* 459: 574-577. IF: 41.6





42. Spehr J, Hagendorf S, Weiss J, **Spehr M**, Leinders-Zufall T, Zufall F (2009) Ca<sup>2+</sup>-calmodulin feedback mediates sensory adaptation and inhibits pheromone-sensitive ion channels in the vomeronasal organ. *The Journal of Neuroscience* 29: 2125-35. IF: 7.9
43. Hagendorf S, Fluegge D, Engelhardt C, **Spehr M** (2009). Homeostatic control of sensory output in basal vomeronasal neurons: activity-dependent expression of ether-à-go-go-related gene potassium channels. *The Journal of Neuroscience* 29: 206-221. IF: 7.9
44. Triller A, Boulden EA, Churchill A, Hatt H, Englund J, **Spehr M**, Sell CS (2008) Odorant-Receptor Interactions and Odor Percept; a Chemical Perspective. *Chemistry and Biodiversity* 5: 862-886. IF: 1.9
45. **Spehr M**, Kelliher KR, Li XH, Boehm T, Leinders-Zufall T, Zufall F (2006) Essential role of the main olfactory system in social recognition of MHC class I peptides. *The Journal of Neuroscience* 26: 1961-1970. IF: 7.9
46. Mashukova A, **Spehr M**, Hatt H, Neuhaus EM (2006) β-arrestin2-mediated internalization of mammalian odorant receptors. *The Journal of Neuroscience* 26: 9902-9912. IF: 7.9
47. Kelliher KR, **Spehr M**<sup>†</sup>, Leinders-Zufall T, Zufall F (2006) Pheromonal recognition memory induced by TRPC2-independent vomeronasal sensing. *European Journal of Neuroscience* 23: 3385-3390. <sup>†</sup> shared first authorship IF: 3.9
48. Michalakis S, Reisert J, Geiger H, Wetzel CH, Zong X, Bradley J, **Spehr M**, Hüttl S, Gerstner A, Pfeifer A, Hatt H, Yau K-W, Biel M (2006) Loss of CNGB1 protein leads to olfactory dysfunction and subciliary CNG channel trapping. *Journal of Biological Chemistry* 281: 35156-35166. IF: 4.0

#### 2001 – 2005

49. Zhainazarov AB, **Spehr M**, Wetzel CH, Hatt H, Ache BW (2004) Modulation of the olfactory CNG channel by PtdIns(3,4,5)P<sub>3</sub>. *Journal of Membrane Biology* 201: 51-57. IF: 2.2
50. **Spehr M**, Schwane K, Heilmann S, Gisselmann G, Hummel T, Hatt H (2004) Dual capacity of a human olfactory receptor. *Current Biology* 14: 832-833. IF: 10.4
51. **Spehr M**, Schwane K, Riffell JA, Barbour J, Zimmer RK, Neuhaus EM, Hatt H (2004) Particulate adenylate cyclase plays a key role in human sperm olfactory receptor-mediated chemotaxis. *Journal of Biological Chemistry* 279: 40194-4203. IF: 4.0
52. Spehr J, **Spehr M**, Hatt H, Wetzel CH (2004) Subunit-specific P2X-receptor expression defines chemosensory properties of trigeminal neurons. *European Journal of Neuroscience* 19: 2497-2510. IF: 3.9
53. **Spehr M**, Gisselmann G, Poplawski A, Riffell JA, Wetzel CH, Zimmer RK, Hatt H (2003) Identification of a testicular odorant receptor mediating human sperm chemotaxis. *Science* 299: 2054-2058. IF: 41.1
54. **Spehr M**, Hatt H, Wetzel CH (2002) Arachidonic acid plays a role in rat vomeronasal signal transduction. *The Journal of Neuroscience* 22: 8429-8437. IF: 7.9
55. **Spehr M**, Wetzel CH, Hatt H, Ache BW (2002) 3-phosphoinositides modulate cyclic nucleotide signaling in olfactory receptor neurons. *Neuron* 33: 731-739. IF: 16.4
56. Wetzel CH, **Spehr M**, Hatt H (2001) Phosphorylation of voltage-gated ion channels in rat olfactory receptor neurons. *European Journal of Neuroscience* 14: 1056-1064. IF: 3.9

### **Review articles:**

1. Mohrhardt J, Nagel M, Fleck D, Ben-Shaul Y, **Spehr M** (2018) Signal detection and coding in the accessory olfactory system. **Chemical Senses** 10.1093/chemse/bjy061. IF: 3.9
2. Legradi JB, Di Paolo C, Kraak MHS *et al.* (2018) An ecotoxicological view on neurotoxicity assessment. **Environ Sci Eur** 30: 46. IF: 4.0
3. **Spehr M** (2010) Sniffing out social signals: Chemical communication and the vomeronasal organ. **e-Neuroforum** 1: 9-16. IF: 1.3
4. **Spehr M** and Munger SD (2009) Olfactory receptors: GPCRs and beyond. **J. Neurochem.** 109: 1570-1583. IF: 4.5
5. **Spehr M**, Spehr J, Kelliher KR, Ukhanov K, Leinders-Zufall T, Zufall F (2006) Parallel processing of social signals by the mammalian main and accessory olfactory systems. **Cell. Mol. Life Sci.** 63: 1476-1484. IF: 7.0
6. **Spehr M**<sup>1</sup>, Schwane K, Riffell JA, Zimmer RK, Hatt H (2006) Odorant receptors and olfactory-like signaling mechanisms in mammalian sperm. **Mol. Cell. Endocrinol.** 250: 128-136. IF: 3.5
7. Aungst J and **Spehr M** (2005) The tuning properties of antennal lobe projection neurons. **J. Neurosci.** 25: 10339-10340. IF: 7.9
8. **Spehr M** and Leinders-Zufall T (2005) One neuron – multiple receptors: increased complexity in olfactory coding? **Science's STKE** 285: 25. IF: 4.1
9. **Spehr M** and Hatt H (2005) A potential role of odorant receptor agonists and antagonists in the treatment of infertility and contraception. **Current Opinion in Investigational Drugs** 6: 364-368. IF: 3.5
10. **Spehr M** and Hatt H (2004) hOR17-4 as a potential therapeutic target. **Drug News Perspect.** 17: 165-171. IF: 2.6

### **Book chapters:**

1. Müller F, Zufall F & **Spehr M** (2020) Sensorisches System – Gustatorisches System & Olfaktorisches System, in: *Lehrbuch Physiologie (7<sup>th</sup> edition)*. Speckmann, Hescheler, Köhling (ed.), Elsevier, Amsterdam, The Netherlands.
2. Rothermel M & **Spehr M** (2020) Chapter 14: Sinnesphysiologie – Geschmacks- und Geruchssinn, in: *Physiologie<sup>2</sup> (1<sup>st</sup> edition)*. Schlüter K-D & Gründer S (ed.), Elsevier, Amsterdam, The Netherlands.
3. Arts M, Mathar R, **Spehr M** (2018) An Information Theoretic Approach to Stimulus Processing in the Olfactory System, in: *Information- and Communication Theory in Molecular Biology*. Bossert M (ed.), Springer: pp.341-366
4. **Spehr M** (2017) Olfactory Subsystems, in: *Springer Handbook of Odor*. Büttner A (ed.), Springer: pp. 631-652.
5. **Spehr M** (2016) Vomeronasal Transduction and Cell Signaling, in: *Chemosensory Transduction - The Detection of Odors, Tastes, and Other Chemostimuli*. Zufall F, Munger SD (eds.), Academic Press: 191-205.
6. Stowers L & **Spehr M** (2015) The Vomeronasal Organ, in: *Handbook of Olfaction & Gustation (3<sup>rd</sup> edition)*. Doty R L (ed.), Wiley-Blackwell, Hoboken, NJ.





7. **Spehr M** (2010) Soziale Signale "erschnüffeln": Chemische Kommunikation und das Vomeronasalorgan. *Neuroforum* 16: 157-164.
8. **Spehr M** (2010) Vom Gen zum Verhalten: Herausforderungen in den Neurowissenschaften. in: *Perspektiven. Forschungsfragen der Zukunft*. Herausgeber: Akademie der Wissenschaften NRW.
9. **Spehr M** (2007) Perspektiven der Neurowissenschaft. in: *Höhepunkte der zoologischen Forschung im deutschen Sprachraum. Festschrift zur 100. Jahresversammlungen der DZG*. Herausgeber: Johann Wolfgang Wägele. Basilisken-Press: 275-284.
10. Hatt H & **Spehr M** (2004) Spermien auf duftenden Spuren. *Forschung. WILEY-VCH*. Herausgegeben von der Deutschen Forschungsgemeinschaft (DFG) 3-4: 28-31.

#### **Invited presentations:**

1. **Spehr M** (2020 / 2021) Novel Advances in Testicular Imaging – Shedding Light on Spermatogenesis. *45<sup>th</sup> Annual Conference of the American Society of Andrology*, Philadelphia, PA, USA.
2. **Spehr M** (2020) The Nose Knows: Chemosensory Mechanisms of Conspecific Communication. *Wilhelminenberg Seminar Talks*, Vienna, Austria.
3. **Spehr M** (2019) Dissecting physiological activity profiles in the seminiferous tubule. 9. *Treffen „Netzwerk Reproduktion“*, Essen, Germany.
4. **Spehr M** (2018) The Nose Knows: A Tale of Odors, Sex and Violence. *Science Cafe FENS Forum*, Berlin, Germany.
5. **Spehr M** (2018) Signaling pathways in spermatogenesis. *University of Florida*, Gainesville, FL, USA.
6. **Spehr M** (2018) Purinergic signaling pathways in mouse testis. *UC Berkeley*, USA.
7. **Spehr M** (2018) Chemosensory Mechanisms of Conspecific Communication. *ENB Elite Master Program Neuroengineering (MSNE)*. TU Munich
8. **Spehr M** (2017) The semiochemical repertoire and strength in laboratory inbred mice and wild animals. *6<sup>th</sup> International Symposium on Olfaction: Brains and Roses*. Ein Gedi, Israel.
9. **Spehr M** (2017) Signaling mechanisms in the mouse accessory olfactory system. *Women In Olfactory Science (WIOS) Symposium*, International School for Advanced Studies (SISSA), Trieste, Italy.
10. **Spehr M** (2017) The semiochemical repertoire and strength in laboratory inbred mice and wild animals. *27<sup>th</sup> Annual Meeting of the European Chemoreception Research Organization ECRO*. Hinxton, Cambridge, UK.
11. **Spehr M** (2017) Signaling mechanisms in the accessory olfactory system. Satellite Symposium on “*Cellular and Molecular Mechanisms of Chemosensory Detection*”, *39<sup>th</sup> annual meeting of the Association of Chemoreception Sciences (AChemS)*, Bonita Springs, Florida, U.S.A.
12. **Spehr M** (2017) Signaling mechanisms in the accessory olfactory system. Satellite Symposium of the DFG Priority Program (SPP 1392) “*Integrative Analysis of Olfaction*” *12<sup>th</sup> Meeting of the German Neuroscience Society*, Göttingen
13. **Spehr M** (2016) Slow oscillatory microcircuits in the mouse accessory olfactory bulb. *Senses, Diet & Disease Meeting: 1<sup>st</sup> Qatar Olfactory Mini Symposium*. Doha, Qatar.



14. **Spehr M** (2016) Slow rhythmogenesis in the mouse accessory olfactory bulb. *5<sup>th</sup> International Symposium on Olfaction: Brains and Roses*. Alicia Foundation, Mont San Benet, Barcelona, Spain.
15. **Spehr M** (2016) Slow rhythmogenesis in the mouse accessory olfactory bulb. *26<sup>th</sup> Annual Meeting of the European Chemoreception Research Organization ECRO*. Athens, Greece.
16. **Spehr M** (2016) Of mice and men: Chemosensory Mechanisms of Social Communication. *Neurobiology Lecture Series*. Heidelberg, Germany.
17. **Spehr M** (2015) Chemosensory mechanisms of conspecific communication. *Hanse-Lecture in Neuroscience*, Hanse-Wissenschafts-Kolleg. Delmenhorst, Germany.
18. **Spehr M** (2015) Chemosensory mechanisms of social communication. *Midterm Colloquium DFG Priority Program 1608*. Kaiserslautern, Germany.
19. **Spehr M** (2015) Extracellular pH regulates excitability of vomeronasal sensory neurons. *Cecam workshop on Computational approaches to chemical senses*. Jülich, Germany
20. **Spehr M** (2014) Extracellular pH regulates excitability of vomeronasal sensory neurons. *3<sup>rd</sup> International Symposium on Olfaction: Brains and Roses*. College de France, Paris, France.
21. **Spehr M** (2014) Calcium signaling in chemical communication. *13<sup>th</sup> International Meeting of the European Calcium Society*. Aix-en-Provence, France.
22. **Spehr M** (2014) Extracellular pH regulates excitability of vomeronasal sensory neurons. *22<sup>nd</sup> workshop of the UK Semiochemistry Network*. Cambridge, UK.
23. **Spehr M** (2014) Extracellular pH regulates excitability of vomeronasal sensory neurons. *Behavior Meets Biochemistry: Animals Making Sense of Molecules Making Scents*. London, UK.
24. **Spehr M** (2013) On the Role of Mitochondrial Calcium in Olfactory Signaling. *SFB 894 Symposium*. Homburg a. d. Saar, Germany.
25. **Spehr M** (2013) Electrophysiology and live-cell imaging in acute slices - The neurophysiology of chemosensory communication. *Leica Microsystems: Neuroscience Workshop*. Wetzlar, Germany.
26. **Spehr M** (2012) Mitochondrial Ca<sup>2+</sup> mobilization is a key element in olfactory signaling. *105<sup>th</sup> Annual Meeting of the German Zoological Society (DZG)*. Konstanz, Germany.
27. **Spehr M** (2012) Of Mice and Men – The chemosensory language of social communication. *NeuroVisionen 8*. Aachen, Germany.
28. **Spehr M** (2012) Formyl peptide receptor-like proteins are a novel family of vomeronasal chemosensors. *43<sup>rd</sup> Annual Meeting of The American Society for Neurochemistry*. Baltimore, MD, USA.
29. **Spehr M** (2012) Mitochondrial Ca<sup>2+</sup> mobilization is a key element in olfactory signaling. *91<sup>st</sup> Annual Meeting of the German Physiological Society (DPG)*. Dresden, Germany.
30. **Spehr M** (2011) Chemosensory Ca<sup>2+</sup> dynamics correlate with diverse motility phenotypes in human sperm. *1<sup>st</sup> International caesar Conference on Sperm Signaling and Motility*. Bonn, Germany.
31. **Spehr M** (2010) Of Mice and Men – Chemosensory Mechanisms of Social Communication. *7<sup>th</sup> Forum of European Neuroscience FENS*. Amsterdam, The Netherlands.



32. **Spehr M** (2010) On the role of mitochondrial calcium in mouse olfactory sensory neurons. *20<sup>th</sup> European Chemoreception Research Organisation Congress ECRO*. Avignon, France.
33. **Spehr M** (2010) Advanced fixed-stage microscopy in neurophysiology. *Leica Microsystems: Amplifying the Power of Imaging workshop*. EMBL Advanced Training Centre. Heidelberg.
34. **Spehr M** (2010) Calcium dynamics associated with human sperm motility. *Weizmann Symposium in Honor of Prof. Michael Eisenbach*. The Weizmann Institute. Rehovot, Israel.
35. **Spehr M** (2009) Of mice and men: The molecular and cellular architecture of chemosensory social communication. *32<sup>nd</sup> Annual Meeting of the Japan Neuroscience Society*. Nagoya, Japan.
36. **Spehr M** (2009) Of mice and men: The molecular and cellular architecture of chemosensory social communication. *Riken BSI Symposium: Fragrance from Germany*. Tokyo, Japan.
37. **Spehr M** (2007) Of mice and men: Conserved chemosensory signaling strategies in diverse mammalian tissues. *5<sup>th</sup> International Symposium on Molecular and Neural Mechanisms for Taste and Olfactory Perception*. Kyushu, Japan.
38. **Spehr M** (2007) Parallel processing of social signals by the main and accessory olfactory system. *17<sup>th</sup> Symposium of the Egyptian-German Society of Zoology*. Dresden, Germany.
39. **Spehr M** (2007) Dissecting the role of odorant receptors in navigating human sperm. *40<sup>th</sup> Annual Meeting of the Society for the Study of Reproduction*. San Antonio, Texas.
40. **Spehr M** (2007) Odorant receptor and sperm function: Do sperm have a sense of smell? *33<sup>rd</sup> Annual American Society of Andrology Meeting*. Tampa, Florida.
41. **Spehr M** (2006) Dissecting the molecular architecture of mammalian pheromone sensing. *4<sup>th</sup> NeuroNRW meeting (Neuro 2006)*. Düsseldorf, Germany.
42. **Spehr M**, Kelliher KR, Li XH, Boehm T, Leinders-Zufall T, Zufall F (2006) Parallel processing of social cues by the main and accessory olfactory system. *17<sup>th</sup> European Chemoreception Research Organisation Congress ECRO*. Granada, Spain.
43. **Spehr M** (2006) Dissecting the role of odorant receptors in sperm physiology and chemotaxis. *93<sup>rd</sup> International Titisee Conference on "Mechanisms of Chemotaxis"*. Titisee, Germany.
44. **Spehr M**, Kelliher KR, Li XH, Boehm T, Leinders-Zufall T, Zufall F (2005) Essential role of the main olfactory system in social recognition of MHC class I peptides. *SfN 35<sup>th</sup> annual meeting*. Washington D.C., USA.
45. **Spehr M** (2005) Off the beaten path – Odorant receptors in sperm-egg communication. *Gordon Research Conference on "Fertilization & Activation of Development"*. Holderness, NH, USA.
46. **Spehr M** (2005) Odorant receptors – candidate key players in sperm-egg communication. *Symposium on "Post-meiotic Approaches to Male Contraception"*. Hong Kong, VR China.
47. **Spehr M** (2004) Odorant receptor (hOR17-4) mediating human sperm chemotaxis. *NIH Meeting on "The Future of Male Contraception"*. Seattle, Washington, USA.
48. **Spehr M** (2004) The hOR17-4 signaling system – one receptor, dual capacity. *26<sup>th</sup> Annual Meeting of the Association for Chemoreception Sciences AchemS*. Sarasota, Florida, USA.



49. **Spehr M** (2003) Dual capacity of an olfactory receptor. *3<sup>rd</sup> Olfactory Bioresponse Meeting*. Dresden, Germany.
50. **Spehr M** (2002) 3-phosphoinositides modulate cyclic nucleotide signaling in olfactory receptor neurons. *15<sup>th</sup> European Chemoreception Research Organisation Congress ECRO*. Erlangen, Germany.
51. **Spehr M**, Wetzel CH, Hatt H and Ache BW (2002) 3-Phosphoinositide signaling in olfactory receptor cells. *24<sup>th</sup> Annual Meeting of the Association for Chemoreception Sciences AchemS*. Sarasota, Florida, USA.