

Nikolaus Maier

Charité–Universitätsmedizin Berlin
Neuroscience Research Center (NWFZ)
Charitéplatz 1, CCO, D-10117 Berlin
Phone: +49(0)30 450 639 064
E-mail: nikolaus.maier at charite.de



Curriculum vitae

- 2012 - present Senior Research Associate at the Neuroscience Research Center, Charité Medical School (tenured)
- 2006 Postdoctoral training, laboratory of Prof. Dietmar Schmitz, Neuroscience Research Center, Charité–Universitätsmedizin Berlin
- 2004 MD ('2. Staatsexamen'; Approbation)
- 1999-2006 Doctoral thesis ('Dr. med') in Neurophysiology: *Elektrophysiologische Untersuchungen zu sharp wave-ripple Komplexen im Hippocampus der Maus*, supervised by Prof. Dr. Andreas Draguhn, Institut für Physiologie, HU Berlin
- 1995-2004 Studies in Medicine, HU Berlin (Charité)

Research fields

I have been studying the cellular, synaptic and network mechanisms of hippocampal rhythms since 1999, contributing to this area of research with the establishment of an *in vitro* model of hippocampal sharp wave/ripple complexes (SWRs). Using electrophysiological approaches, my research specifically focuses on both chemical and electrical neuronal synchronization during physiological and pathologically altered high-frequency oscillations.

Activities in the scientific community, honors, awards, grants, teaching

- Oct. 2016 Instructor, Cajal Course 2016: Hippocampus; Bordeaux School of Neuroscience
- 2015- present Co-PI (with Prof. Dietmar Schmitz), BMBF-Verbundprojekt SMARTAGE
- 2006 Doctoral thesis with honors (summa cum laude), Charité Medical School Berlin
- since 2005 Teaching in Neurophysiology: MD program, Charité Medical School; International Graduate Program Medical Neurosciences Master Program, Charité Medical School; and in the Bachelor Program Bioinformatics (Freie Universität Berlin)
- 2005 Minerva Short-Term Research Grant, 2005, Minerva Foundation
- since 2004 Member of the NWG – *Neurowissenschaftliche Gesellschaft*

Reviewer for the following journals: *Hippocampus*, *Journal of Neurophysiology*, *Neural Plasticity*, *Neuroscience*, *Neuroscience & Biobehavioral Reviews*, *PLoS ONE*

Selected Publications

Swaminathan, A., Wichert, I., Schmitz, D. #, and **Maier, N.** #* (2018) Involvement of Mossy Cells in Sharp Wave-Ripple Activity In Vitro, *Cell Reports* 23: 1-9. | #senior authors, * lead contact

Donoso, J., Schmitz, D., **Maier N.** #, and Kempter R. #* (2018) Hippocampal Ripple Oscillations and Inhibition-First Network Models: Frequency Dynamics and Response to GABA Modulators. *J. Neurosci.* 38: 3124-3146. | #co-last authors, * corresponding author

Winterer J.*, **Maier N.***, Wozny C., Beed P., Breustedt J., Evangelista R., Peng Y., D'Albis T., Kempter R. and Schmitz D. (2017) Excitatory Microcircuits within Superficial Layers of the Medial Entorhinal Cortex. *Cell Reports* 19: 1110-1116. | *equal contribution

Maier N. & Kempter R. (2017) Hippocampal Sharp Wave/Ripple Complexes—Physiology and Mechanisms. Book Chapter. In: *Cognitive Neuroscience of Memory Consolidation*. Pt. III, pp. 227-249. Springer International Publishing.

Kreye J., Wenke N.K., Chayka M., ..., **Maier N.**, ..., Prüss H. (2016) Human cerebrospinal fluid monoclonal N-methyl-D-aspartate receptor autoantibodies are sufficient for encephalitis pathogenesis. *Brain* 139: 2641-2652.

Böhm C., Peng Y., **Maier N.**, Winterer J., Poulet J.F., Geiger J.R., Schmitz D. (2015) Functional Diversity of Subicular Principal Cells during Hippocampal Ripples. *J. Neurosci.* 35: 13608-18.

Fidzinski P., Korotkova T., Heidenreich M., **Maier N.**, Schuetze S., Kobler O., Zuschratter W., Schmitz D., Ponomarenko A., Jentsch T.J. (2015) KCNQ5 K(+) channels control hippocampal synaptic inhibition and fast network oscillations. *Nat. Commun.* 6: 6254.

Maier N., Draguhn A., Schmitz D., Both M. (2013) Fast network oscillations in the hippocampus. Review. *e-Neuroforum* 4: 1-10.

Pangalos M., Donoso J.R., Winterer J., Zivkovic A.R., Kempter R., **Maier N.*** and Schmitz D.* (2013) Recruitment of oriens-lacunosum-moleculare interneurons during hippocampal ripples. *Proc. Natl. Acad. Sci. U.S.A* 110: 4398-4403. | *equal contribution, corresponding authors

Traub R.D., Schmitz D., **Maier N.**, Whittington M.A. and Draguhn A. (2012) Axonal properties determine somatic firing in a model of in vitro CA1 hippocampal sharp wave/ripples and persistent gamma oscillations. *Eur. J. Neurosci.* 36: 2650-2660.

Maier N.*, Morris G., Schuchmann S., Korotkova T., Ponomarenko A., Böhm C., Wozny C. and Schmitz D*. (2012) Cannabinoids disrupt hippocampal sharp wave-ripples via inhibition of glutamate release. *Hippocampus* 22: 1350-1362. | *corresponding authors

Maier N.*, Tejero-Cantero A.*, Dornn A.L., Winterer J., Beed P.S., Morris G., Kempter R., Poulet J.F.*, Leibold C.* and Schmitz D.* (2011) Coherent phasic excitation during hippocampal ripples. *Neuron* 72: 137-152. | *equal contribution

Bähner, F., Weiss, E.K., Birke, G., **Maier, N.**, Schmitz, D., Rudolph, U., Frotscher, M., Traub, R.D., Both, M., Draguhn, A. (2011) Cellular correlate of assembly formation in oscillating hippocampal networks in vitro. *Proc. Natl. Acad. Sci. U.S.A.* 108: E607-E616.

Maier N., Morris G., Jochenning F.W. and Schmitz D. (2009) An approach for reliably investigating hippocampal sharp wave-ripples in vitro. *PLoS ONE* 4: e6925.

Wozny C.*, **Maier N.***, Fidzinski P., Breustedt J., Behr J.* and Schmitz D*. (2008) Differential cAMP signaling at hippocampal output synapses. *J. Neurosci.* 28: 14358-14362. | *equal contribution

Nimmrich V.*, **Maier N.***, Schmitz D. and Draguhn A. (2005) Induced sharp wave-ripple complexes in the absence of synaptic inhibition in mouse hippocampal slices. *J. Physiol.* 563: 663-670. | *equal contribution

Maier N., Nimmrich V. and Draguhn A. (2003) Cellular and network mechanisms underlying spontaneous sharp wave-ripple complexes in mouse hippocampal slices. *J. Physiol.* 550: 873-887.

Maier N., Güldenagel M., Söhl G., Siegmund H., Willecke K. and Draguhn A. (2002) Reduction of highfrequency network oscillations (ripples) and pathological network discharges in hippocampal slices from connexin 36-deficient mice. *J. Physiol.* 541: 521-528.