



Univ.-Prof. Dr. Frank Kirchhoff

Dr. rer. nat.
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since 2009

Full Professor (W3) for Physiology, Faculty of Medicine,
University of Saarland

since 2021

Adjunct Professor, Experimental Research Center for
Normal and Pathological Aging, University of Medicine
and Pharmacy of Craiova, 200349, Craiova, Romania

Education

- 1998 Habilitation, Biochemistry, Free University Berlin, Mentors: Prof. Dr. Ferdinand Hucho/Prof. Dr. Helmut Kettenmann
- 1990 Dr. rer. nat., Neurobiology, Institute for Neurobiology, Heidelberg University, Supervisor: Prof. Dr. Melitta Schachner
- 1986 Diploma, Biochemistry, University of Hannover, Supervisor: Prof. Dr. Melitta Schachner
- 1981-1986 Studies of Biochemistry, University of Hannover

Professional career

- 2000-2009 Group leader „Glial Physiology and Imaging“, Department of Neurogenetics, Max Planck Institute for Experimental Medicine, Göttingen
- 1998-2008 Lecturer Free University Berlin
- 1995-1999 Research Assistant „Cellular Neurosciences“ (Prof. Dr. Helmut Kettenmann), Max Delbrück Center for Molecular Medicine, Berlin
- 1991-1994 Research Assistant „Cellular Neurobiology“, Institute for Neurobiology, Heidelberg University (PD Dr. Helmut Kettenmann)

Honors and Awards

- since 2023 President of the German Neuroscience Society (NWG)
- 2021-23 Vice president of the German Neuroscience Society (NWG)
- 2018-2021 Senator of the University of Saarland
- since 2016 Member Academia Europaea
- 2016-2021 Coordinator EU-H2020-MSCA ITN EU-GliaPhD (a European Graduate Training Network)
- since 2014 Visiting Professor at University of Medicine and Pharmacy of Craiova, Craiova, Romania
- 2013-2023 Coordinator of the Priority Program SPP 1757 „Glial Heterogeneity“ of the German Research Foundation (DFG)
- 2012-2022 Member of the International Scientific Advisory Committee of the Achucarro Basque Center for Neuroscience, Bilbao, Spain
- 2010 Offer Full Professorship (W3) for Anatomy, University of Bonn and Group leader at Research Center Caesar (Bonn), declined
- since 2009 Member of the Editorial Board „GLIA“
- 1987-1989 Doctoral scholarship Boehringer Ingelheim Fonds
- 1981-1986 Scholarship Studienstiftung des deutschen Volkes

Research Interests

Our research focuses on the molecular and cellular mechanisms of neuron-glia interaction in the central nervous system. We are pursuing the following research questions: How do glial transmitter receptors sense and modulate synaptic transmission? What is the impact for living organisms? How do glial cells respond to acute injuries within the central nervous system?

Selected publications (>150, H-factor 57), *WoS ResearcherID: B-9335-2008, ORCID 0000-0002-2324-2761*

1. Fang LP, Zhao N, Caudal LC, Chang HF, Zhao R, Lin CH, Hainz N, Meier C, Bettler B, Huang W, Scheller A, [Kirchhoff F](#), Bai X. (2022) Impaired bidirectional communication between interneurons and oligodendrocyte precursor cells affects social cognitive behavior. **Nat Commun.** 13: 1394. doi: 10.1038/s41467-022-29020-1
2. Laporte MH, Chi KI, Caudal LC, Zhao N, Schwarz Y, Rolland M, Martinez-Hernandez J, Martineau M, Chatellard C, Denarier E, Mercier V, Lemaître F, Blot B, Moutaux E, Cazorla M, Perrais D, Lanté F, Bruns D, Fraboulet S, Hemming FJ, [Kirchhoff F](#), Sadoul R. (2022) Alix is required for activity-dependent bulk endocytosis at brain synapses. **PLoS Biol.** 20:e3001659. doi: 10.1371/journal.pbio.3001659.
3. Gobbo D, Scheller A, [Kirchhoff F](#). (2021) From Physiology to Pathology of Cortico-Thalamo-Cortical Oscillations: Astroglia as a Target for Further Research. **Front Neurol.** 12:661408.
4. Schweigmann M, Caudal LC, Stopper G, Scheller A, Koch KP, [Kirchhoff F](#). (2021) Versatile Surface Electrodes for Combined Electrophysiology and Two-Photon Imaging of the Mouse Central Nervous System. **Front Cell Neurosci.** 15: 720675.
5. Caudal LC, Gobbo D, Scheller A, [Kirchhoff F](#) (2020) The Paradox of Astroglial Ca²⁺ Signals at the Interface of Excitation and Inhibition. **Front Cell Neurosci.** 14: 609947.
6. Huang W, Guo Q, Bai X, Scheller A, [Kirchhoff F](#) (2019) Early embryonic NG2 glia are exclusively gliogenic and do not generate neurons in the brain. **Glia** 67:1094-1103
7. Huang W, Bai X, Stopper L, Catalin B, Cartarozzi LP, Scheller A, [Kirchhoff F](#) (2018) During Development NG2 Glial Cells of the Spinal Cord are Restricted to the Oligodendrocyte Lineage, but Generate Astrocytes upon Acute Injury. **Neuroscience** 385:154-165.
8. Jahn HM, Kasakow CV, Helfer A, Michely J, Verkhatsky A, Maurer HH, Scheller A and [Kirchhoff F](#) (2018) Refined protocols of tamoxifen injection for inducible DNA recombination in mouse astroglia. **Scientific Reports** 8, 5913.
9. Cartarozzi LP, Rieder P, Bai X, Scheller A, Oliveira ALR, [Kirchhoff F](#) (2018) In vivo two-photon imaging of motoneurons and adjacent glia in the ventral spinal cord. **J Neurosci Methods** 299:8-15.
10. Schwarz Y, Zhao N, [Kirchhoff F](#), Bruns D (2017) Astrocytes control synaptic strength by two distinct v-SNARE-dependent release pathways. **Nat Neurosci** 20: 1529-1539.
11. Saab AS, Tzvetavona ID, Trevisiol A, Baltan S, Dibaj P, Kusch K, Möbius W, Goetze B, Jahn HM, Huang W, Steffens H, Schomburg ED, Pérez-Samartín A, Pérez-Cerdá F, Bakhtiari D, Matute C, Löwel S, Griesinger C, Hirrlinger J, [Kirchhoff F](#), Nave KA (2016) Oligodendroglial NMDA Receptors Regulate Glucose Import and Axonal Energy Metabolism. **Neuron** 91:119-32.
12. Rudolph R, Jahn HM, Courjaret R, Messemer N, [Kirchhoff F](#), Deitmer JW (2016) The inhibitory input to mouse cerebellar Purkinje cells is reciprocally modulated by Bergmann glial P2Y1 and AMPA receptor signaling. **Glia** 64: 1265-80.
13. Huang W, Zhao N, Bai X, Karram K, Trotter J, Goebbels S, Scheller A, [Kirchhoff F](#) (2014) Novel NG2-CreERT2 knock-in mice demonstrate heterogeneous differentiation potential of NG2 glia during development. **Glia** 62: 896-913.
14. Kettenmann H, [Kirchhoff F](#), Verkhatsky A (2013) Microglia: new roles for the synaptic stripper. **Neuron** 9: 10-8.
15. Saab AS, Neumeyer A, Jahn HM, Cupido A, Šimek AAM, Boele HJ, Scheller A, Le Meur K, Götz M, Monyer H, Sprengel R, Rubio ME, Deitmer JW, De Zeeuw CI and [Kirchhoff F](#) (2012) Bergmann Glial AMPA Receptors are Required for Fine Motor Coordination. **Science** 337:749-53

16. Dibaj P, Nadrigny F, Steffens H, Scheller A, Hirrlinger J, Schomburg ED, Neusch C, [Kirchhoff F](#) (2010) NO mediates microglial response to acute spinal cord injury under ATP control in vivo. **Glia** 58:1133-1144.
17. Hirrlinger J, Scheller A, Hirrlinger PG, Kellert B, Tang W, Wehr MC, Goebbels S, Reichenbach A, Sprengel R, Rossner MJ, [Kirchhoff F](#) (2009) Split-cre complementation indicates coincident activity of different genes in vivo. **Plos One** 4:e4286.
18. Hirrlinger PG, Scheller A, Braun C, Hirrlinger J, [Kirchhoff F](#) (2006) Temporal control of gene recombination in astrocytes by transgenic expression of the tamoxifen-inducible DNA recombinase variant CreERT2. **Glia** 54:11-20.
19. Nimmerjahn A, [Kirchhoff F](#), Helmchen F (2005) Resting microglial cells are highly dynamic surveillants of brain parenchyma in vivo. **Science** 308:1314-1318.
20. Hirrlinger J, Hulsman S, [Kirchhoff F](#) (2004) Astroglial processes show spontaneous motility at active synaptic terminals in situ. **Eur J Neurosci** 20:2235-2239.