

University of Leipzig
Rudolf-Schönheimer-Institute of Biochemistry
Division of General Biochemistry
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POSITIONS

University of Leipzig, Germany

Full professor and department chair (October 2016-)
Rudolf-Schönheimer-Institute of Biochemistry / Division of General Biochemistry

University of Würzburg, Germany

Heisenberg Professor (May 2016-October 2016)
Institute of Physiology

University of Würzburg, Germany

Independent group leader (July 2009-April 2016)
Institute of Physiology / Department of Neurophysiology

EDUCATION

University of Würzburg, Germany

Habilitation, Physiology (2014)
Title: Physiological functions and signal transduction of Adhesion class G protein-coupled receptors
Examiners: Manfred Heckmann (Würzburg), Thomas C. Südhof (Stanford)

University of Oxford, United Kingdom

DPhil, Neuroscience/Biochemistry (2009)
Thesis: Functional analysis of latrophilins, a class of putative G-protein-coupled receptors. Advisor: Andreas Russ
Committee: Allison Woollard (Oxford), Torsten Schöneberg (Leipzig)

University of Oxford, United Kingdom

MSc, Neuroscience (2005) - *Distinction*
Master thesis (Hilary term): Genetic analysis of the dynein light chain *roadblock* in the nervous system of the nematode *Caenorhabditis elegans*. Advisor: Andreas Russ
Master thesis (Trinity term): The influence of NMDA-receptor activity on presynaptic Ca²⁺ transients at associational synapses in the hippocampus. Advisor: Nigel Emptage
Committee: Kia Nobre, Andrew King, Jeremy Taylor, Ole Paulsen (Oxford)

University of Oxford, United Kingdom

Studies in Neuroscience (2004-2005)

University of Würzburg, Germany

Dr. med., Neuroanatomy (2006) - *Summa cum laude*
Thesis: Ciliary neurotrophic factor (CNTF) in the olfactory system of rats and mice. Advisor: Esther Asan
Committee: Esther Asan, Michael Sendtner (Würzburg), Hans-Dieter Hofmann (Freiburg)

University of Würzburg, Germany

Approbation - License to practice (2004)
Studies in Human Medicine (1997-2004)

PUBLICATIONS

*Correspondence / #Equal contribution

Original Research Papers

- Asan E, **Langenhan T**, Holtmann B, Bock H, Sendtner M, Carroll P (2003) Ciliary neurotrophic factor in the olfactory bulb of rats and mice. *Neuroscience* 120:99–112.
- Langenhan T**, Sendtner M, Holtmann B, Carroll P, Asan E (2005) Ciliary neurotrophic factor-immunoreactivity in olfactory sensory neurons. *Neuroscience* 134:1179–1194.
- Vakonakis I, **Langenhan T**, Prömel S, Russ A, Campbell ID (2008) Solution structure and sugar-binding mechanism of mouse latrophilin-1 RBL: a 7TM receptor-attached lectin-like domain. *Structure* 16:944–953.
- Langenhan T**, Prömel S, Mestek L, Esmaili B, Waller-Evans H, Hennig C, Kohara Y, Avery L, Vakonakis I, Schnabel R, Russ AP (2009) Latrophilin signaling links anterior-posterior tissue polarity and oriented cell divisions in the *C. elegans* embryo. *Dev Cell* 17:494–504.
- McGuinness L, Taylor C, Taylor RDT, Yau C, **Langenhan T**, Hart ML, Christian H, Tynan PW, Donnelly P, Emptage NJ (2010) Presynaptic NMDARs in the hippocampus facilitate transmitter release at theta frequency. *Neuron* 68:1109–1127.
- Waller-Evans H, Prömel S, **Langenhan T**, Dixon J, Zahn D, Colledge WH, Doran J, Carlton MBL, Davies B, Aparicio SAJR, Grosse J, Russ AP (2010) The orphan adhesion-GPCR GPR126 is required for embryonic development in the mouse. *PLoS ONE* 5:e14047.
- Prömel S*, Waller-Evans H, Dixon J, Zahn D, Colledge WH, Doran J, Carlton MBL, Grosse J, Schöneberg T, Russ AP, **Langenhan T*** (2012) Characterization and functional study of a cluster of four highly conserved orphan adhesion-GPCRs in mouse. *Dev Dyn* 241:1591-1602.
- Prömel S, Frickenhaus M, Hughes S, Mestek L, Staunton D, Woollard A, Vakonakis I, Schöneberg T, Schnabel R, Russ AP#, **Langenhan T**#, (2012) The GPS motif is a molecular switch for bimodal activities of Adhesion-class G protein-coupled receptors. *Cell Rep* 2 :321-331.
- Dawydow A, Gueta R, Ljaschenko D, Ullrich S, Hermann M, Ehmann N, Gao S, Fiala A, **Langenhan T**, Nagel G*, Kittel RJ* (2014) Channelrhodopsin-2-XXL, a powerful optogenetic tool for low-light applications. *Proc Natl Acad Sci U S A* 111(38):13972-13977.
- Scholz N, Gehring J, Guan C, Ljaschenko D, Fischer R, Kittel RJ*, **Langenhan T***. The Adhesion GPCR Latrophilin/CIRL shapes mechanosensation. *Cell Rep* 11:866–874.
- Backhaus P, **Langenhan T**, and Neuser K (2016) Effects of transgenic expression of botulinum toxins in *Drosophila*. *J Neurogenet* 30:22–31.

Reviews

- Langenhan T** (2006) Ciliary neurotrophic factor (CNTF) in the olfactory system of rats and mice. *Ann Anat* 188:411–413.
- Langenhan T**#, Russ AP#, (2010) Latrophilin signalling in tissue polarity and morphogenesis. *Adv Exp Med Biol* 706:37–48.
- Araç D, Aust G, Calebiro D, Engel FB, Formstone C, Goffinet A, Hamann J, Kittel RJ, Liebscher I, Lin HH, Monk KR, Petrenko A, Piao X, Prömel S, Schiöth HB, Schwartz TW, Stacey M, Ushkaryov YA, Wobus M, Wolfrum U, Xu L, **Langenhan T** (2013) Dissecting signaling and functions of adhesion G protein-coupled receptors. *Ann N Y Acad Sci* 1276:1-25.
- Prömel S#, **Langenhan T**#, Araç D#, (2013) Matching structure with function: the GAIN domain of Adhesion-GPCR and PKD1-like proteins. *Trends Pharmacol Sci* 34 (8):470-478.
- Langenhan T**#, Aust G#, Hamann J# (2013) Sticky signaling - Adhesion class G protein-coupled receptors take the stage. *Sci Signal* 6:re3.

Hamann J^{*,}, Aust G[#], Araç D, Engel FB, Formstone C, Fredriksson R, Hall RA, Harty BL, Kirchhoff C, Knapp B, Krishnan A, Liebscher I, Lin HH, Martinelli DC, Monk KR, Peeters MC, Piao X, Prömel S, Schöneberg T, Schwartz TW, Singer K, Stacey M, Ushkaryov YA, Vallon M, Wolfrum U, Wright MW, Xu L, **Langenhan T[#]**, Schiöth HB^{*,} (2015) International Union of Basic and Clinical Pharmacology. XCIV. Adhesion G Protein-Coupled Receptors. *Pharmacol Rev* 67(2):338–367.

Monk KR, Hamann J, **Langenhan T**, Nijmeijer S, Schöneberg T, Liebscher I (2015) Adhesion G Protein-Coupled Receptors: From In Vitro Pharmacology to In Vivo Mechanisms. *Mol Pharmacol* 88:617–623.

Langenhan T^{*}, Barr MM, Bruchas MR, Ewer J, Griffith LC, Maiellaro I, Taghert PH, White BH, Monk KR^{*} (2015) Model Organisms in G Protein-Coupled Receptor Research. *Mol Pharmacol* 88:596–603.

Langenhan T^{*}, Piao X^{*}, Monk KR^{*} (2016) Adhesion G protein-coupled receptors in nervous system development and disease. *Nat Rev Neurosci* 17:550-561.

Book Chapters

Langenhan T^{*}, Russ AP^{*} (2010) Latrophilin signalling in tissue polarity and morphogenesis. In: *Adhesion-GPCRs: Structure to Function* S. Yona and M. Stacey (Ed.), Landes Bioscience and Springer.

Nieberler M, Kittel RJ, Petrenko AG, Lin H-H^{*}, **Langenhan T^{*}** (2016) Control of Adhesion GPCR Function Through Proteolytic Processing. In: *Adhesion G Protein-coupled Receptors – Molecular, Physiological and Pharmacological Principles in Health and Disease*. T. Langenhan and T. Schöneberg (Ed.), Springer Nature.

Scholz N^{*}, Monk KR, Kittel RJ, **Langenhan T^{*}** (2016) Adhesion GPCRs as a Putative Class of Metabotropic Mechanosensors. In: *Adhesion G Protein-coupled Receptors – Molecular, Physiological and Pharmacological Principles in Health and Disease*. T. Langenhan and T. Schöneberg (Ed.), Springer Nature.

Books

Adhesion G Protein-coupled Receptors – Molecular, Physiological and Pharmacological Principles in Health and Disease. (2016) Ed. **T. Langenhan** and T. Schöneberg. Springer Nature.

TEACHING

Lecturer and instructor, General Human Physiology, Institute of Physiology, University of Würzburg (2009-2016)

Tutor, Molecular and Developmental Biology, Pembroke College & Department of Biochemistry, University of Oxford (2008)

Tutor, Macroscopic und Microscopic Neuroanatomy, Dept of Experimental Psychology, University of Oxford (2005-2008)

Tutor, Macroscopic Anatomy (dissection course), Institute for Anatomy and Cell Biology, University of Würzburg (1999-2003)

AWARDS & HONOURS

Heisenberg Professorship, German Research Foundation (2015)

Selected participant at PENS/Hertie Winter School "Structure and Function of Neural Circuits", Organizers: Bert Sakmann & Michael Häusser (2009)

Wolfgang-Bargmann-Prize, German Anatomical Society (2006)

Thesis award of the Medical Faculty, University of Würzburg (2006)

Wellcome Trust Doctoral Programme in Neuroscience, Full scholarship, University of Oxford (2004-2008)

David Rockefeller Graduate Scholarship, Rockefeller University, New York (2004, declined)

Homburger-Scholarship, University of Würzburg (2003)

SERVICE

Chairman and board member, Adhesion-GPCR consortium (2012-Present)

Reviewer for several journals and research organisations (DFG, Cancer Research UK, Biotechnology and Biological Sciences Research Council UK, Netherlands Organisation for Scientific Research, Russian Science Foundation)

FUNDING

DFG La 2861/7-1 (Heisenberg professorship): Physiology and pathophysiology of mechanosensitive signalling pathways. (2015-)

DFG SFB/TR 166/1-C3: FRET-based monitoring of Adhesion class G protein-coupled receptor activity. (2015-2019)

DFG-Research Unit 2149 "Elucidation of Adhesion-GPCR signaling". Spokesman: T. Langenhan (2015-2017)

La 2861/4-1: Functional analysis of genetically encoded aGPCR signaling states

La 2861/5-1: Physiological role of aGPCR auto-proteolysis (jointly with Dr. R.J. Kittel)

La 2861/6-1: Administrative project

DFG SFB 1047/1-A5: Circadian plasticity at synapses of *Drosophila melanogaster*. (2013-2017)
(jointly with Dr. R.J. Kittel)

DFG La 2861/1-1: Function and properties of the adhesion-G-protein-coupled receptor latrophilin in the fruit fly *Drosophila melanogaster*. (2010-2013)

IZKF Würzburg Z-3/12: Modes of signal transduction and interaction partners of latrophilin receptors. (2010-2012)



Prof. Dr. med. Tobias Langenhan, M.Sc., D.Phil. (Oxon)

- Leipzig, June 2017 -