

Curriculum Vitae

Personal Data

Title	Prof. Dr. med. (MD)
First name	THOMAS
Name	KUNER
Current position	Institute Director and Full (W3) Professor of Functional Neuroanatomy
Current institution(s)/site(s), country	Institute for Anatomy and Cell Biology, Medical Faculty of Heidelberg University, Heidelberg, Germany
ORCID-ID	0000-0003-1896-9031

Qualifications and Career

Stages	Periods and Details
Degree programme	04/1988 – 09/1998, Medical studies, Heidelberg University, Germany
Doctorate	1992 – 1998, Molecular Neurobiology, Center for Molecular Biology Heidelberg (ZMBH), Heidelberg, Germany Title: "Isoform-spezifische Wirkungen von Ethanol, Argiotoxin636 und Magnesium (II) Ionen auf N-Methyl-D-Aspartat Rezeptorkanäle: Funktionelle Charakterisierung und Bestimmung struktureller Determinanten" (Prof. Dr. Peter H. Seeburg)
Stages of academic/professional career	Academic Career Since 06/2022, Director of the Institute for Anatomy and Cell Biology, Heidelberg University, Heidelberg , Germany Since 08/2012, Professor and Director , Department of Functional Neuroanatomy, Institute for Anatomy and Cell Biology, Heidelberg University, Heidelberg , Germany 08/2006 – 07/2012, Professor (W3) of Ultrastructural Research at the Department of Medical Cell Biology, Institute for Anatomy and Cell Biology 2003, Habilitation in Physiology, Title " Ionotrope Glutamatrezeptoren: Strukturelle Grundlagen und biophysikalische Mechanismen der Ionenpermeation", (Prof. Dr. Bert Sakmann) 11/2000 – 07/2006, Group leader at the Department of Cell Physiology, Max Planck Institute for Medical Research, Heidelberg 08/1998 – 010/2000, Postdoc at the Department of Neurobiology, Duke University Medical Center, Durham ,

	and Marine Biological Laboratory, Woods Hole , USA (Prof. Dr. George J. Augustine)
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Activities in the Research System

Since 2023	Member of the Structures committee, Medical Faculty HD
Since 2023	Member of the Steering Committee, CellNetworks Core Technology Platform, Heidelberg University
Since 2014	Speaker of the Steering Committee of the Electron Microscopy Core Facility, Heidelberg University
2013-2023	Member of the Research Committee of Medical Faculty HD
Since 2013	Member of the Habilitation Committee of Heidelberg University Medical Faculty
2003 - 2006	Speaker of the WIN Kolleg of the Heidelberg Academy of Sciences
Since 2002	Faculty & Instructor: Neurobiology Course MBL Woods Hole; Neurophotonics Summer School, Quebec; Cajal Advanced Neuroscience Training Course

Activities as scientific reviewer (selection)

Scientific journals: Elife, European Journal of Physiology, Frontiers journals, Journal of Neuroscience, Nature, Nature Cancer, Nature Communications, Nature Neuroscience, Neuron, PLoS Biology, PLoS One, Science

Organisations and foundations: Agence nationale de la recherche, Alexander von Humboldt Stiftung, Boehringer Ingelheim, Daimler Benz Stiftung, Deutsche Forschungsgemeinschaft, European Research Council, German Israeli Foundation, Israel Science Foundation, Netherlands Organization for Scientific Research, Netherlands Organization for Health Research and Development, Schram Foundation, Studienstiftung des deutschen Volkes

Supervision of Researchers in Early Career Phases

Since 2000 I have supervised 26 PhD students, 27 MD students, 14 Master students, 5 Bachelor students, 17 postdoctoral or physician scientists, 5 junior group leaders and 1 habilitation who received an offer for a professorship in Göttingen, 3 postdoctoral scientists obtained professorships. I also mentored an independent research group at BioMedX.

Academic Distinctions

Scholarships

2000 – 2003	Habilitation Fellowship of the Claussen-Simon Foundation
2000	Grass Fellowship in Neurosciences
1999 – 2000	Human Frontiers in Science Program Long-Term Fellowship
1998 – 1999	Feodor-Lynen Fellow of the Alexander von Humboldt Foundation
1989 – 1994	Scholar of the German National Scholarship Foundation (Studienstiftung des deutschen Volkes)

Awards

2024	BIAL Award in Biomedicine 2023
2014	Heidelberg University Annual Price for Exceptional Achievements
2012	Fellow of the Marsilius Kolleg for Interdisciplinary Studies at Heidelberg University

Scientific Results

Category A (10 selected)

1. Hausmann, D., D.C. Hoffmann, V. Venkataramani, E. Jung, S. Horschitz, S.K. Tetzlaff, A. Jabali, L. Hai, T. Kessler, D.D. Azoñin, S. Weil, A. Kourtesakis, P. Sievers, A. Habel, M.O. Breckwoldt, M.A. Karreman, M. Ratliff, J.M. Messmer, Y. Yang, E. Reyhan, S. Wendler, C. Löb, C. Mayer, K. Figarella, M. Osswald, G. Solecki, F. Sahm, O. Garaschuk, **T. Kuner**, P. Koch, M. Schlesner, W. Wick, and F. Winkler (2023). Autonomous rhythmic activity in glioma networks drives brain tumour growth. **Nature**. 613:179–186. doi:10.1038/s41586-022-05520-4.
Glioma cell networks connected by tumor microtubules are orchestrated by autonomously active tumor cells. We characterized the contribution of KCa3.1 to this activity using electrophysiological recordings.
2. Venkataramani V*, Yang Y, Schubert MC, Reyhan E, Tetzlaff SK, Wissmann N, Botz M, Soyka SJ, Beretta CA, Pramatarov RL, Fankhauser L, Garofano L, Freudenberg A, Wagner J, Tanev DI, Ratliff M, Xie R, Kessler T, Hoffmann DC, Hai L, Dorflinger Y, Hoppe S, Yabo YA, Golebiewska A, Niclou SP, Sahm F, Lasorella A, Slowik M, Doring L, Iavarone A, Wick W, **Kuner T*** & F. Winkler*. Glioblastoma hijacks neuronal mechanisms for brain invasion. **Cell** 2022; 185:2899-2917. DOI: 10.1016/j.cell.2022.06.05491.
This work discovered that glioma cells use cellular mechanisms known from neurons, such as migration, neuronal cell states and synaptic communication. Key technologies enabling this work were established in my department and include correlative electron microscopy, reconstructive two-photon time-lapse imaging, and electrophysiology. These neuronal features of glioblastoma cells could be the basis for novel treatment strategies.
3. Gangadharan, V., H. Zheng, F.J. Taberner, J. Landry, T.A. Nees, J. Pistolic, N. Agarwal, D. Männich, V. Benes, M. Helmstaedter, B. Ommer, S.G. Lechner, **T. Kuner**, and R. Kuner. Neuropathic pain caused by miswiring and abnormal end organ targeting. **Nature** 2022; 606:137–145. DOI: 10.1038/s41586-022-04777-z.
Two-photon in vivo time-lapse imaging and development of an automated analysis pipeline was a key for discovering miswired nerves, which in turn target end organs in an aberrant way and thereby cause a novel form of chronic pain.
4. Klevanski M, Herrmannsdoerfer F, Sass S, Venkataramani V, Heilemann M, and **Kuner T**. Automated highly multiplexed super-resolution imaging of protein nano-architecture in cells and tissues. **Nat Commun**. 2020; 11:1552. DOI:10.1038/s41467-020-15362-1.
Novel technique for highly multiplexed super-resolution imaging of cellular machines enabling superposition of up to 16 different proteins at 25 nm resolution.
5. Venkataramani, V.*, D. I. Tanev, C. Strahle, A. Studier-Fischer, L. Fankhauser, T. Kessler, C. Korber, M. Kardorff, M. Ratliff, R. Xie, H. Horstmann, M. Messer, S. P. Paik, J. Knabbe, F. Sahm, F. T. Kurz, A. A. Acikgoz, F. Herrmannsdorfer, A. Agarwal, D. E. Bergles, A. Chalmers, H. Miletic, S. Turcan, C. Mawrin, D. Hanggi, H. K. Liu, W. Wick, F. Winkler* & **T. Kuner***. Glutamatergic synaptic input to glioma cells drives brain tumour progression. **Nature** 2019; 573:532-538. DOI: 10.1038/s41586-019-1564-x.
This work discovered a novel entity of synapse between neurons and tumor cells that promotes tumor cell propagation and migration. Neuroglial synapses were discovered in my department and the full complement of our methodologies was applied to reveal the core properties of these synapses. A key feature of these synapses, namely their composition by calcium-permeable AMPA-type glutamate receptors, could be a promising new target for therapy development. First clinical trials are on the way.
6. Venkataramani, V., Herrmannsdörfer, F., Heilemann, M., **Kuner, T.** SuReSim – Simulating localization microscopy experiments from ground truth models. **Nature Methods** 2016; 13:319-21. DOI: 10.1038/nmeth.3775.
Simulation and validation of localization microscopy data for high fidelity nanoscopy.

7. Nunes, D. and **T. Kuner**. Axonal sodium channel NaV1.2 drives granule cell dendritic GABA release and rapid odor discrimination. **PLoS Biology** 2018; 16(8):e2003816. DOI: 10.1371/journal.pbio.2003816
Resolving a long-held conundrum in demonstrating that dendritic neurotransmitter release depends on Na channels, just like release from presynaptic terminals.
8. Körber, C., Horstmann, H., Venkataramani, V., Herrmannsdörfer, F., Kremer, T., Kaiser, M., Schwenger, D.B., Ahmed, S., Dean, C., Dresbach, T. & **T. Kuner**. Modulation of presynaptic release probability by the vertebrate-specific protein mover. **Neuron**, 2015; 87:521-533. DOI: 10.1016/j.neuron.2015.07.001.
Identified mover as a presynaptic protein regulating release probability in the calyx synapse.
9. Osswald M, Jung E, Sahm F, Solecki G, Venkataramani V, Blaes J, Weil S, Horstmann H, Wiestler B, Syed M, Huang L, Ratliff M, Karimian Jazi K, Kurz FT, Schmenger T, Lemke D, Gommel M, Pauli M, Liao Y, Haring P, Pusch S, Herl V, Steinhauser C, Krunic D, Jarahian M, Miletic H, Berghoff AS, Griesbeck O, Kalamakis G, Garaschuk O, Preusser M, Weiss S, Liu H, Heiland S, Platten M, Huber PE, **Kuner T**, von Deimling A, Wick W, F. Winkler. Brain tumour cells interconnect to a functional and resistant network. **Nature** 2015; 528:93-8. DOI: 10.1038/nature16071.
Discovery and characterization of cell extensions of brain tumor cells that are relevant for key pathological hallmarks, and interconnect to a communicating network. We contributed the electron microscopic analysis revealing the ultrastructure of tumor microtubes.
10. Abraham NM, Egger V, Shimshek DR, Renden R, Fukunaga I, Sprengel R, Seeburg PH, Klugmann M, Margrie TW, Schaefer AT, **T Kuner**. Synaptic inhibition in the olfactory bulb accelerates odor discrimination in mice. **Neuron** 2010; 65: 399-411. DOI: 10.1016/j.neuron.2010.01.009.
First link between synaptic functional features and olfactory behavior.