Directors

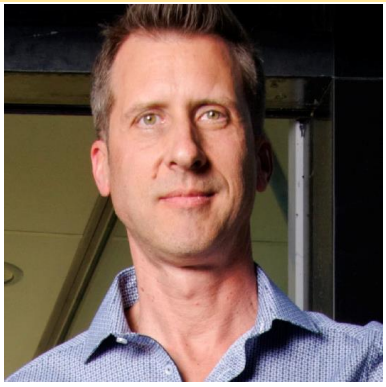
Fritjof Helmchen, PhD | University of Zurich (Switzerland)

Dr. Fritjof Helmchen received his Diploma in Physics from the University of Heidelberg. He completed his PhD thesis in Neuroscience at the May-Planck-Institute for Medical Research in Heidelberg and received his doctorate from the University of Göttingen in 1996. As a postdoc, Dr. Helmchen worked at the Bell Laboratories, Lucent Technologies, NJ, where he pioneered in vivo applications of two-photon microscopy. He then returned to the Max-Planck-Institute for Medical Research, Heidelberg, heading a junior research group from 2000-2005. In 2005, Dr. Helmchen was appointed Professor of Neurophysiology and Co-Director at the Brain Research Institute of the University of Zurich, Switzerland. Fritjof Helmchen's research focuses on the development and application of optical methods (in particular two-photon microscopy) to study neural activity on the single-cell and neural circuit level. His group has pioneered several microscopy techniques and contributed to recent advancements in the study of behavior-related circuit dynamics in the mouse brain. Most recently, they applied novel optical approaches to study mesoscale functional connectivity during whisker-based texture discrimination behavior and during learning of such a discrimination task. Fritjof Helmchen is a recipient of several awards, including an ERC Advanced Grant and the Cloëtta Prize 2015. He serves as a member of several foundation boards and of the research council of the Swiss National Science Foundation (SNSF), and he is the current Director of the Neuroscience Center Zurich.

Selected publications:

- *Gilad A, Helmchen F (2020) Spatiotemporal refinement of signal flow through association cortex during learning, Nature Communications, 11(1):1744.*
- *Sych Y, Chernysheva M, Sumanovski LT, Helmchen F (2019) High-density multi-fiber photometry for studying large-scale brain circuit dynamics. Nature Methods,16(6):553-560.*
- *Voigt FF, Kirschenbaum D, Platonova E, Pagès S, Campbell RAA, Kästli R, Schaettin R, Egolf L, van der Bourg A, Bethge P, Haenraets K, Frézel N, Topilko T, Perin P, Hillier D, Hildebrand S, Schueth A, Roebroeck A, Roska B, Stoeckli E, Pizzala R, Renier N, Zeilhofer HU, Karayannis T, Ziegler U, Batti L, Holtmaat A, Lüscher C, Aguzzi A, Helmchen F (2019) The mesoSPIM initiative: open-source light-sheet mesoscopes for imaging in cleared tissue. Nature Methods, (11):1105-1108.*
- *Chen JL, Margolis DJ, Stankov A, Sumanovski LT, Schneider BL, Helmchen F (2015) Pathway-specific reorganization of projection neurons in somatosensory cortex during learning. Nature Neuroscience*, 18(8):1101-1108.
- *Chen JL, Carta S, Soldado-Magraner J, Schneider BL, Helmchen F (2013) Behavior-dependent recruitment of long-range projection neurons in somatosensory cortex. Nature, 499:336-340*

Andreas Frick, PhD | Bordeaux Neurocampus (France)



Dr. Andreas Frick received his Diploma in Biology from the Technical University of Munich, Germany. He pursued his PhD thesis in Neuroscience at the Max Planck Institute for Psychiatry in Munich and received his Dr. rer. nat. from the Technical University of Munich in 1999. As postdoc, Dr. Frick worked under the supervision of Prof. Daniel Johnston at Baylor College of Medicine, Houston, Texas, where his work was the first to suggest that memories might be stored in the functional properties of dendritic ion channels. He then went to the Max Planck Institute for Medical Research under the directorship of Nobel Laureate, Prof. Bert Sakmann, where he worked as Research Group Leader from 2004-2007. In 2008, Dr. Frick was appointed as group leader of the newly established Neurocentre Magendie, Bordeaux, France. Andreas Frick's research focuses on how memories are formed in the neocortex, and how information processing is altered in autism spectrum disorder — both from the levels of ion channels, single cells, circuits, up to cognitive abilities. His group has contributed to a better mechanistic understanding of atypical sensory experience in autism spectrum disorder which supports novel therapeutic treatment options. Andreas Frick is the recipient of several awards, including the 2019 Marcel Dassault Prize for Mental Health Research and the 2020 SFARI Research Award. He serves as member of several foundation boards, and he is currently Research Director at the Neurocentre Magendie.

Selected publications:

- *Del Pino, I., Tocco, C., Magrinelli, E., Marcantoni, A., Ferraguto, C., Tomagra, G., Alfano, C., Leinekugel, X., *Frick, A., *Studer, M. (2020) COUP-TFI/Nr2f1 orchestrates intrinsic neuronal activity during development of the somatosensory cortex. Cerebral Cortex, in press; *co-last author.*
- *Aloisi, E., Le Corf, K., Dupuis, J., Zhang, P., Ginger, M., Labrousse, V., Spatuzza, M., Haberl, MG., Costa, LT., Shigemoto, R., Thappe Theoder, A., Drago, F., Piazza, PV., Mulle, C., Groc, L., Ciranna, L., Catania, MV., Frick, A. (2017) Altered surface mGluR5 dynamics provoke synaptic NMDAR dysfunction and cognitive defects in Fmr1 knockout mice. Nature Communications. 2017 Oct 24;8(1):1103. doi: 10.1038/s41467-017-01191-2.*
- *Haberl, M. G., Zerbi, V., Veltien, A., Ginger, M., Heerschap, A., and Frick A. (2015). Structural-functional connectivity deficits of neocortical circuits in the Fmr1-/y mouse model of autism. Science Advances, 1(10), e1500775–e1500775. doi:10.1126/sciadv.1500775.*
- *Zhang*, Y., Bonnan*, A., Bony*, G., Ferezou, I., Pietropaolo, S., Ginger, M., Sans, N., Rossier, J., Oostra, B., LeMasson, G., Frick, A. (2014) Dendritic Channelopathies Contribute to Neocortical Hyperexcitability and Sensory Hypersensitivity in the Fmr1-/y Mice. Nature Neuroscience, 17, 1701–1709 (2014) doi:10.1038/nn.3864.*
- *Frick, A., Magee, J., and Johnston, D. (2004). Long-term potentiation is accompanied by an enhanced local excitability of pyramidal neuron dendrites. Nature Neuroscience, 7(2):126-135*

Cyril Herry, PhD | Bordeaux Neurocampus (France)

During my PhD, I showed for the first time electrophysiological evidence of a specific role of prefrontal plasticity in the inhibition of fear responses during consolidation of extinction. I then switched my research during my postdoctoral training in the laboratory of Pr. Andreas Luthï to study the role of the amygdala in the acquisition of extinction. There, I successfully implanted and developed the technique of long lasting single unit recordings in behaving animals and was able to identify distinct amygdala neuronal populations selectively implicated in the behavioral transition between high and low fear states. In 2011 I was awarded a prestigious ERC starting grant that allowed me to set up my laboratory in the Neurocenter Magendie. My laboratory long-term project in this institute is to identify and manipulate the circuits underlying fear behavior to ultimately develop new therapeutic strategies for anxiety-related pathologies.

Selected publications:

- *Prefrontal-periaqueductal gray-projecting neurons mediate context fear discrimination. Rozeske RR, et al. (2018) Neuron, 97: 898-910.*
- *Prefrontal neuronal assemblies temporally control fear behaviour. Dejean C.,et al. (2016). Nature, 535: 420-4.*
- *Internally generated 4 hz oscillations synchronize prefrontal-amygdala neuronal cirucits during fear behaviour. Karalis N., et al. (2016) Nature Neuroscience.19,605-12.*
- *Encoding of fear learning and memory in distributed neuronal circuits. Herry, C., et al. (2014). Nature Neuroscience, 17: 1644-54.*