

## Matthew Larkum

Humboldt-Universität zu Berlin  
Institute of Biology  
Charitéplatz 1  
D-10117 Berlin

Phone: +49 (0)30 450539117  
Email: matthew.larkum(at)hu-berlin.de



### Curriculum vitae

Since 2011	Full professor (W3), Neurobiology, Humboldt-Universität zu Berlin
2004 – 2011	Professor, Swiss National Science Foundation (SNSF), Institute of Physiology, Universität Bern, CH
1997 – 2003	Postdoctoral fellow, Max Planck Institute for Medical Research, Heidelberg
1992 – 1996	PhD, Institute of Physiology, Universität Bern, CH
1991	First class honours in Physiology, University of Sydney, AU
1987 – 1990	Bachelor of Science, University of Sydney, AU

### Research fields

Our group focuses on the processing of feedforward and feedback information in the cortex, and particularly, on the contribution of active dendritic properties to the computational power of neocortical pyramidal neurons. Recent topics include:

- Dendritic spikes in the tuft and basal dendrites of neocortical pyramidal neurons
- Memory consolidation with active dendritic mechanisms
- Mechanisms underlying perceptual processes
- Development of behavioural methodologies for rodents
- Inhibitory control of cortical microcircuits
- Cellular basis for interhemispheric inhibition in the cerebral cortex
- The relationship between machine learning and the brain
- Effects of common anesthetics on single-cell computation in the cortex
- Development of state-of-the-art optical approaches for studying cortical dendritic activity

### Activities in the scientific community, honors, awards

2015	European Research Council (ERC), Advanced Grant
2010	Robert Bing Prize, Swiss Academy of Medical Sciences, CH
2008	Pfizer Research Award in Neurosciences and Diseases of the Nervous System, CH
2006	Theodor Kocher Prize, CH
2003	Nikon Research Fellowship, Woods Hole Research Laboratories, US
2002	Woods Hole Research Fellowship, US
1999 – 2001	Postdoctoral scholarship, Max Planck Society (MPG)
1997 – 1998	Humboldt Research Fellowship for Postdoctoral Researchers, Alexander von Humboldt Foundation
1992 – 1995	Australian Postgraduate Research Award

## **Selected publications**

- Gidon A, Zolnik TA, Fidzinski P, Bolduan F, Papoutsi A, Poirazi P, Holtkamp M, Vida I, Larkum ME. Dendritic action potentials and computation in human layer 2/3 cortical neurons. *Science* 2020; 367: 83-87
- Suzuki M, Larkum ME. General Anesthesia Decouples Cortical Pyramidal Neurons. *Cell* 2020; 180: 666-676 e613
- Seibt J, Richard CJ, Sigl-Glockner J, Takahashi N, Kaplan DI, Doron G, de Limoges D, Bocklisch C, Larkum ME. Cortical dendritic activity correlates with spindle-rich oscillations during sleep in rodents. *Nat Commun* 2017; 8: 684
- Suzuki M, Larkum ME. Dendritic calcium spikes are clearly detectable at the cortical surface. *Nat Commun* 2017; 8: 276
- Takahashi N, Oertner TG, Hegemann P, Larkum ME. Active cortical dendrites modulate perception. *Science* 2016; 354: 1587-1590
- Larkum M. A cellular mechanism for cortical associations: an organizing principle for the cerebral cortex. *Trends Neurosci* 2013; 36: 141-151
- Palmer LM, Schulz JM, Murphy SC, Ledergerber D, Murayama M, Larkum ME. The cellular basis of GABA(B)-mediated interhemispheric inhibition. *Science* 2012; 335: 989-993
- Larkum ME, Nevian T, Sandler M, Polsky A, Schiller J. Synaptic integration in tuft dendrites of layer 5 pyramidal neurons: a new unifying principle. *Science* 2009; 325: 756-760
- Murayama M, Perez-Garci E, Nevian T, Bock T, Senn W, Larkum ME. Dendritic encoding of sensory stimuli controlled by deep cortical interneurons. *Nature* 2009; 457: 1137-1141
- Larkum ME, Zhu JJ, Sakmann B. A new cellular mechanism for coupling inputs arriving at different cortical layers. *Nature* 1999; 398: 338-341