

Matthew Larkum

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Curriculum vitae

since 2011 Professor (W3), Neurobiology, Humboldt-Universität zu Berlin
2004 – 2011 SNSF Professor, Institute of Physiology, University of Bern
1997 – 2003 Postdoctoral fellow (Advisor: Prof. Bert Sakmann), Max Planck Institute for Medical Research, Heidelberg
1992 – 1996 PhD (supervisor: Hans-Rudolf Lüscher), Institute of Physiology, University of Bern
1987 – 1991 Bachelor of Science, University of Sydney (First Class Honors)

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:

- Cellular basis for interhemispheric inhibition in the cerebral cortex
- Effect of fetal alcohol syndrome on dendritic processing
- Dendritic spikes in the tuft and basal dendrites of neocortical pyramidal neurons
- Inhibitory control of cortical microcircuits
- 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

2010 Robert Bing Prize, Swiss Academy of Medical Sciences
2007 Pfizer Prize for the best neuroscience paper published by a Swiss group
2006 Theodor Kocher Prize
2004 Professorship, Swiss National Science Foundation (SNSF)
2003 Nikon Research Fellowship, Woods Hole Research Laboratories
2002 Woods Hole Research Fellowship
1999 – 2001 Max Planck Society Scholarship
1997 – 1998 Alexander von Humboldt Scholarship
1992 – 1995 Australian Postgraduate Research Award

Selected publications

Ledergerber, D and Larkum, ME. Properties of layer 6 pyramidal neuron apical dendrites. *J Neurosci*. 2010; 30, 13031-44.

Murayama, M, Perez-Garci, E, Nevian, T, Bock, T, Senn, W and Larkum, ME. Dendritic encoding of sensory stimuli controlled by deep cortical interneurons. *Nature*. 2009; 457, 1137-41.

Murayama, M and Larkum, ME. In vivo dendritic calcium imaging with a fiberoptic periscope system. *Nat Protoc*. 2009; 4, 1551-9.

Murayama, M and Larkum, ME. Enhanced dendritic activity in awake rats. *Proc Natl Acad Sci U S A*. 2009; 106, 20482-6.

Larkum, ME, Nevian, T, Sandler, M, Polsky, A and Schiller, J. Synaptic integration in tuft dendrites of layer 5 pyramidal neurons: a new unifying principle. *Science*. 2009; 325, 756-60.

Bathellier, B, Margrie, TW and Larkum, ME. Properties of piriform cortex pyramidal cell dendrites: implications for olfactory circuit design. *J Neurosci*. 2009; 29, 12641-52.

Larkum, ME and Nevian, T. Synaptic clustering by dendritic signalling mechanisms. *Curr Opin Neurobiol*. 2008; 18, 321-31.

Nevian, T*, Larkum, ME*, Polsky, A and Schiller, J. Properties of basal dendrites of layer 5 pyramidal neurons: a direct patch-clamp recording study. *Nat Neurosci*. 2007; 10, 206-14. | *equal contribution

Perez-Garci, E, Gassmann, M, Bettler, B and Larkum, ME. The GABAB1b isoform mediates long-lasting inhibition of dendritic Ca²⁺ spikes in layer 5 somatosensory pyramidal neurons. *Neuron*. 2006; 50, 603-16.

Larkum, ME, Senn, W and Luscher, HR. Top-down dendritic input increases the gain of layer 5 pyramidal neurons. *Cereb Cortex*. 2004; 14, 1059-70.