

IGSN - SYMPOSIUM

Monday, February 11th 2019 • 15.00 (3 pm)

FNO – 01 / 117

Olfactory perception and information processing in the piriform cortex

FRIEDRICH JOHENNING

Neuroscience Research Center/Einstein Center for Neuroscience, Charité University Medicine Berlin

Micro- and Mesoscale Calcium Imaging in the Piriform Cortex *ex vivo* and *in vivo*

In my talk, I will present two projects focussing on the piriform or olfactory cortex. The first 'ex vivo' part of my talk deals with the postnatal development of dendritic growth in the three-layered olfactory cortex: During development, initial primitive circuits are refined by neuronal activity from the periphery. Developmental regulation of dendritic shape plays a key role in determining which part of the potential input space is sampled by a given neuron. The olfactory system is receptive right after birth and therefore serves as an ideal model to understand developmental dendritic growth strategies aimed at sampling sensory bottom-up and intracortical top-down inputs differentially. With respect to vertical layering, glutamatergic cells in the superficial part of layer 2 receive more sensory and less associative input than cells in the deeper portion of layer 2. This is most clearly demonstrated by the lack of basal dendrites in a subpopulation of layer 2 cells, the semilunar cells. Basal dendrites are longer and more complex in deep layer 2 cells. Here, we use these two distinct types of glutamatergic layer 2 neurons in the piriform or olfactory cortex as a model to study the time course of circuit-specific dendritic development from birth to the first postnatal weeks. We apply 3D-calcium imaging of global dendritic calcium signals evoked by spontaneously occurring network events in acute p4-p8 brain slices. We identify a reduction in the peak of dendritic calcium hotspots occurring during spontaneous activity in basal dendrites of superficial cells, a dendrite population that does not display branching and growth.

In the second 'in vivo' part, I will demonstrate how we use a microendoscope in combination with a miniaturized microscope for calcium imaging to study olfactory cortex network dynamics during food consumption in freely behaving mice.

Host:

HANNA KRUSE

Department of Neurophysiology, Faculty of Medicine, Ruhr University Bochum

Guests are welcome!International Graduate School of Neuroscience
Ruhr-University Bochum