LIN Colloquium

Abstract

Who: **Miguel Remondes DVM PhD**

Instituto de Medicina Molecular (IMM)
Faculdade de Medicina da Universidade de Lisboa, Portugal

What: **A Gradient of Hippocampal Inputs to the Medial Mesocortex**

Tuesday, Jan 15, 2019, 15:00 h

Ebbinghaus Lecture Hall (ground floor)
Brenneckestr. 6, 39118 Magdeburg
Leibniz Institute for Neurobiology

Prof. Dr. Magdalena Sauvage

0391-6263-94011
magdalena.sauvage@lin-magdeburg.de
magdalena.sauvage@gmail.com

LIN Colloquium

Miguel Remondes, DVM, Ph.D., Instituto de Medicina Molecular, Neuroscience Unit, Lisbon, Portugal

Abstract

Memory-guided decisions depend on complex, finely tuned neural mechanisms linking primary sensory input, spatial memory, and decision-making. This includes interactions between hippocampus and medial mesocortical regions anterior cingulate and retrosplenial cortex. The functional circuitry underlying these interactions is unclear. Using viral anatomical tracing, *in vitro* and *in vivo* electrophysiology, and optogenetics, we show that such circuitry is characterized by a functional-anatomical gradient. Contrary to common notions, CG does receive direct projections from CA1. These projections are excitatory and originated exclusively from dorsal-intermediate CA1 *stratum piramidale*. RSC also receives inputs originating in CA1 *radiatum* and *lacunosum-moleculare*, including GAD+ neurons providing long-range GABAergic projections (LRIP). Such hippocampal projections establish *bona fide* synapses throughout MMC cortical layers, with RSC densely targeted on its layer III, around which it receives a combination of inhibitory and excitatory synapses. This is reflected in the pattern of spontaneous co-activity of MMC and HIPP in the awake-behaving animal and is consistent with RSC encoding visual-spatial information with the HIPP, and CG processing HIPP spatial information relevant to encode task-space. We are currently monitoring and manipulating the above neural circuits during behavior, to ultimately understand how we go from receiving primary sensory inputs, to building an enduring mental map of context, and deciding on the appropriate actions in a changing world.