RUHR-UNIVERSITÄT BOCHUM

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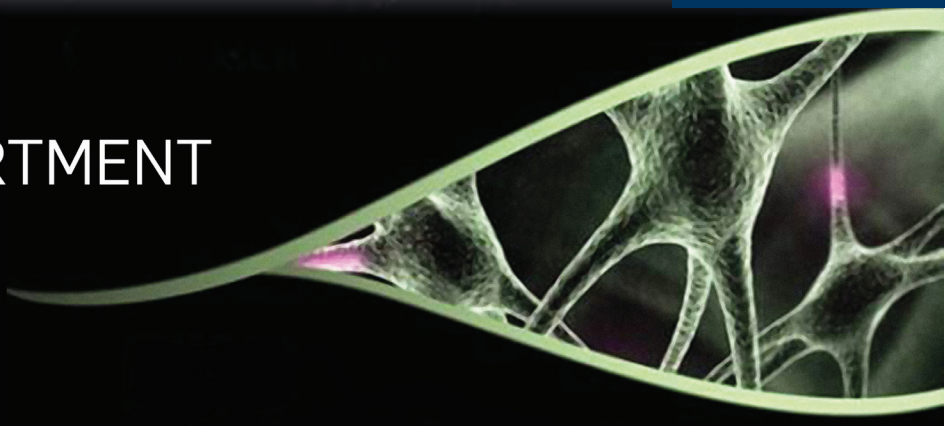
RESEARCH DEPARTMENT
of Neuroscience



YOUNG SCIENTIST COLLOQUIUM

Monday, June 27th, 16.00 ct, FNO 01/117

on

Synaptic and neural support of brain plasticity and memory

Abstract:

Synaptic plasticity refers to experience-dependent changes in synaptic strength that comprises a key cellular mechanism for learning and long-term retention of recorded experience. Long-term potentiation (LTP) and long-term depression (LTD) of synaptic strength are the key forms that are believed to interact with one another to enable complex and lasting cognitive representations and memory that are particularly encoded at the level of the hippocampus. The emergence of these phenomena can be observed by recording hippocampal field potentials in learning animals *(presentation 1, H. Hagena)*. These forms of synaptic plasticity can be very persistent and thus, comprise cellular analogs of long-term memory. At the level of the hippocampus very persistent forms of LTP and LTD often depend on protein synthesis, and it is this process that is believed to enable the linked association of temporally proximal experiences, by means of a process called synaptic tagging (*presentation 2, J. Kudolo*).

Sensory information is the primary input source for experience-dependent changes in synaptic function, and within the primary sensory cortices pre-processing of sensory information can be observed using methods such as voltage-sensitive dye imaging in visually stimulated mammals (*presentation 3, Z. Azimi*). Although it is widely believed that experience is stored primarily within excitatory synapses of neurons, non-neuronal cells, such as glia, comprise an intrinsic feature of the neural circuitry that supports plasticity (*presentation 4, E. Dzyubenko*).

In this colloquium, we shall report on current research and knowledge as to the processes that support synaptic and neural plasticity.