

DANDRITE Topical Seminar

Monday 16 January 2017
at 13.00 – 14.00

Building 1170, room 347, Aarhus University

Zoltan Somogyvari



PhD,
Dept. of Theory,
Wigner Research Institute for Physics of the HAS,
Budapest, Hungary.

Seminar on "Determination of spatio-temporal input current patterns of single hippocampal neurons based on extracellular potential measurements."

One of the main obstacle to decipher the information processing and the neural communication in the brain is the lack of any experimental technique which is able to measure the spatio-temporal distribution of synaptic currents on individual neurons in freely behaving animals. Thus, we developed a new micro electric imaging technique, which is able to determine the currents flowing on single cortical or thalamic neurons during action potentials based on the extracellular (EC) electric potentials recorded by micro electrode array. We have shown the differences of cell-type specific input current patterns preceding and causing the action potentials during different oscillatory states of hippocampus. The layers and subfields of the hippocampus have been identified based on the recorded electrical signals, by using our electroanatomy concept and latter verified by histology. The types of the EC recorded and clustered cells were determined based on their electrophysiological characteristics and their spatial tuning. As the dynamics of the total synaptic current is depends on the natural statistics of the synaptic activations, measuring the spatio-temporal aspects of net synaptic currents could lead to better understanding of the neural code, by refining our knowledge about the input-output transformation implemented by the neurons.

Host: Group Leader Duda Kvitsiani, DANDRITE, Dept. of Molecular Biology and Genetics, Aarhus University