



Introductory Remarks to Symposium 14

Adaptive processes and inhomogeneous neuronal networks – two sides of the same coin?

Ulrich Egert and Stefan Rotter, Freiburg

Models of networks in the brain are often implicitly assumed to be homogeneous in structure but in fact the properties of neurons and synapses vary considerably across one and the same network. Moreover, the structure of networks is highly dynamic, driven for example by homeostatic responses to these inhomogeneities. What seems homogeneous on one scale of observation may easily appear inhomogeneous on another: parameters like neuron density, neuron types, synaptic circuit motifs, patchy connectivity patterns, and many other aspects of this sort, can be viewed either on more microscopic or more macroscopic scales.

In addition to statistical fluctuations, pathological conditions (e.g. through input deprivation, stroke, dysplasia, epilepsy, etc.) can induce dramatic changes to network structure. These changes, in turn, can provoke adaptive responses ranging from synaptic plasticity, over remodeling of axons and dendrites, to neurogenesis.

It is obvious that all this can have a profound impact on the activity dynamics of the network. The goal of this symposium is to highlight some of these phenomena from a perspective that integrates experiments and theory, encouraging a more systematic study of inhomogeneity and adaptivity in the future.

Symposium 14

Thursday, March 21, 2019
14:30 - 16:30, Lecture Hall 10

Chairs: Ulrich Egert and Stefan Rotter, Freiburg

- 14:30 **Opening Remarks**
- 14:35 Samora Okujeni, Freiburg
SELF-ORGANIZED NETWORK INHOMOGENEITY GOVERNS SPONTANEOUS ACTIVITY DYNAMICS (S14-1)
- 15:05 Júlia Gallinaro, Freiburg
CELL ASSEMBLY FORMATION AND NON-RANDOM CONNECTIVITY IN NETWORKS SUBJECT TO HOMEOSTATIC STRUCTURAL PLASTICITY (S14-2)
- 15:35 Anna Levina, Tübingen
SELF-ORGANIZATION OF NEURONAL DYNAMICS BY PLASTICITY AND ADAPTATION (S14-3)
- 16:05 Christos Galanis, Freiburg
DOPAMINE BLOCKS HOMEOSTATIC EXCITATORY SYNAPTIC PLASTICITY IN IMMATURE DENTATE GRANULE CELLS OF ENTORHINO-HIPPOCAMPAL TISSUE CULTURES (S14-4)
- 16:20 **Concluding Remarks**