

Introductory Remarks to Symposium 7

The 4th dimension of plasticity: extracellular matrix interplay with neurons and glia at the synapse

Svilen Georgiev and Silvio Rizzoli, Goettingen

Synaptic plasticity in the central nervous system (CNS) is a complex phenomenon, influenced by several cells, and a substantial number of molecular factors. Plasticity covers many events that lead to structural and functional alterations of synaptic morphology, which occur both in early development and after maturation, in response to learning and memory, or to brain injury. Alterations in plasticity affect cognitive brain functions and are major determinant in numerous brain disorders.

The major drivers of plasticity are pre- and postsynaptic sites of two adjacent neurons. Nevertheless, glial cells, once considered merely supportive, are now recognized as active participants in CNS plasticity. In addition, recent research has highlighted the crucial role of the extracellular matrix (ECM) in shaping neuronal connectivity and synaptic plasticity, thus introducing the concept of the tetrapartite synapse, formed by the pre- and postsynaptic compartments, assisted by glia and the ECM.

In recent years, emerging research has shown intricate processes wherein glial cells indirectly influence neuronal synapses through dynamic interactions with the ECM, consequently altering the functional properties of synapses. Understanding these nuanced interactions between neurons, glial cells and the ECM is imperative for elucidating the complex mechanisms governing CNS plasticity, and requires multidisciplinary approaches integrating diverse methodologies and technologies to dissect the sophisticated dynamics at play within the tetrapartite synapse.

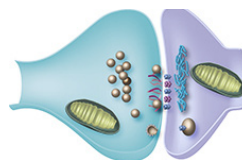
This symposium aims to foster interdisciplinary discussions and collaborations, bringing together glia experts and prominent specialists from the field of ECM studies to further explore synaptic plasticity in the context of the tetrapartite synapse and its implications for neurological health and disease.

Symposium 7

*Thursday, March 27, 2025
10:30 – 12:30, Lecture Hall 9*

Chairs: Svilen Georgiev and Silvio Rizzoli, Goettingen

- 10:30 **Opening Remarks**
- 10:35 Dirk M. Hermann, Essen
EXTRACELLULAR MATRIX REMODELING IN THE ISCHEMIC BRAIN (S7-1)
- 11:00 Casper Hoogenraad, Utrecht, Netherlands
POLARIZED MICROTUBULE REMODELING TRANSFORMS THE MORPHOLOGY OF REACTIVE MICROGLIA AND DRIVES CYTOKINE RELEASE (S7-2)
- 11:25 Charlotte Catharina Oldenburg, Hamburg
MICROGLIAL-NEURONAL INTERACTIONS IN THE RECOVERY PHASE OF ISCHEMIC STROKE (S7-3)
- 11:40 Vincent Vialou, Paris, France
THE MATRICELLULAR PROTEIN HEVIN IN REWARD-RELATED PLASTICITY (S7-4)
- 12:05 Liliia Kushnireva, Rehovolt, Israel
STRUCTURE-FUNCTION ANALYSIS OF PNN DESTRUCTION IN HEALTH AND DISEASE (S7-5)



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