

## Introductory Remarks to Symposium 15

### Building blocks of the brain: insights into CNS circuits and ultrastructure

*Matthias Haberl and Martina Schifferer, Berlin and Munich*

Form and function of neurons are closely intertwined, both for neural circuit wiring but also for the neuronal ultrastructure. Our comprehension of the principles that govern the structural organization in the brain has advanced significantly over the last decade with the help of critical technological innovation and optimization. In particular volume electron microscopy (vEM) has enabled the reconstruction of larger neuronal circuits and revealed subcellular morphology. However, the complexity and scale of the neuronal structure and their circuits continue to elude us in many ways, still leaving crucial gaps in our understanding of randomness, controlled organization, and cell type specificity of neuronal circuit wiring and intracellular ultrastructure.

In this symposium the speakers will provide new insights into CNS circuits and ultrastructure. We will also show how these findings have been enabled by cutting-edge technological developments in the fields of vEM, ultra-high throughput electron microscopy and correlative light- and electron microscopy (CLEM). The speakers will show exciting new findings from meticulously constructed 3D cellular maps, synapses and neuronal wiring diagrams, across the brains of different species (fish, rodent and marmoset brain), revealing common features and differences across different cell types and species, in health and pathology. Our goal is to share how novel technical approaches help to reveal ultrastructural building blocks of the nervous system.

## Symposium 15

*Thursday, March 27, 2025  
14:30 - 16:30, Lecture Hall 102*

Chair: Matthias Haberl and Martina Schifferer,  
Berlin and Munich

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| 14:30 | <b>Opening Remarks</b>   |
| 14:35 | Kevin Briggman, Bonn<br>GAUSS-EM: GUIDED ACCUMULATION OF ULTRATHIN SERIAL SECTIONS WITH A STATIC MAGNETIC FIELD FOR VOLUME ELECTRON MICROSCOPY OF WHOLE BRAINS (S15-1) |
| 15:00 | Martina Schifferer, Munich<br>ARRAY TOMOGRAPHY: TRAILS TO DISCOVERY IN NEUROPATHOLOGY (S15-2)  |
| 15:25 | Kristina Ponimaskine, Hamburg<br>CLUSTERED POSTSYNAPTIC DENSITY DYNAMICS IN CA1 HIPPOCAMPAL NEURONS (S15-3)  |
| 15:35 | Yoshiyuki Kubota, Okazaki, Japan<br>MICROCIRCUITS IN THE MARMOSET PREFRONTAL CORTEX ANALYZED WITH LARGE VOLUME ELECTRON MICROSCOPY (S15-4)                             |
| 16:00 | Matthias Haberl, Berlin<br>ORGANIZATION PRINCIPLES OF THE NEURONAL ULTRASTRUCTURE REVEALED WITH VOLUME ELECTRON MICROSCOPY (S15-5)                                     |
| 16:25 | <b>Discussion and Concluding Remarks</b>   |