

## Introductory Remarks to Symposium 16

### A new look at neuronal circuits after CNS injury: mechanisms for vulnerability and repair

*Francesco Roselli and Aya Takeoka, Ulm and Leuven (Belgium)*

Recovery, repair, and regeneration of circuits are critical steps toward the restoration of the brain and spinal cord functions after injury. Yet, patients with traumatic brain or spinal cord injury experience only limited recovery, incomplete repair, and often no regeneration. The present symposium reports i) on the mechanisms which drive vulnerability of neuronal or synaptic subpopulations upon trauma, ii) on the mechanisms enhancing or preventing effective re-growth of axons, iii) on the re-establishment of functional short- and long-range circuits, and iv) how to overcome obstacles toward the restoration of functions.

The symposium brings together investigators studying the optic nerve, cortical, and spinal cord injuries, providing both a unified view of the injury and repair processes and discussing the peculiarities of each site. The speakers will introduce the cutting-edge biochemical, viral, and biotechnological tools they deploy to address recovery and regeneration in these settings, highlighting advantages and perspectives for their tools. Prof. Nawabi will show how proteomics and translomics of the injured optic nerve reveal how to modulate regenerative axons path to form functional circuits. Prof. Roselli will show how chemogenetic manipulations of microcircuit activity produce beneficial or detrimental changes in neuronal vulnerability and neuroinflammation. Prof. Takeoka will introduce cell type specificity regulating spinal circuit remodeling after spinal cord injury and a viral approach to facilitate recovery. Dr. Puttagunta will introduce the use of engineered biomaterials and cell transplantation to foster repair and regrowth of neuronal circuits after spinal cord injury. Dr. Georgiev will introduce shared concepts related to the remodeling of neuronal extracellular matrix, a component of neuronal regeneration and regrowth that is growingly recognized as a major player in determining neuronal responses to injury.

## Symposium 16

*Thursday, March 23, 2023  
16:15 - 18:15, Lecture Hall 102*

*Chairs: Francesco Roselli and Aya Takeoka,  
Ulm and Leuven (Belgium)*

- 16:15 Homaira Nawabi, La Tronche, France  
ADULT AXON GUIDANCE TO REFORM A FUNCTIONAL NEURONAL CIRCUIT IN THE VISUAL SYSTEM (S16-1)
- 16:40 Francesco Roselli, Ulm  
CHEMOGENETIC CONTROL OF CIRCUIT VULNERABILITY AND NEUROINFLAMMATION IN TBI (S16-2)
- 17:05 Aya Takeoka, Leuven, Belgium  
AGE OF INJURY-DEPENDENT LOCOMOTOR CIRCUIT PLASTICITY AFTER A SPINAL CORD INJURY (S16-3)
- 17:30 Radhika Puttagunta, Heidelberg  
BRIDGING THE GAP AFTER SCI (S16-4)
- 17:55 Svilen Veselinov Georgiev, Goettingen  
REMODELING OF THE NEURONAL EXTRACELLULAR MATRIX (S16-5)