Bonn-Cologne Computational Neuroscience Seminar

Unraveling the Complexity of Brainstem-Spinal Locomotor Control

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Talk Abstract:
Locomotion is essential for animal survival and needs to be continuously adapted for different tasks such as the generation of different locomotor speeds, gaits, and turning movements. Neuronal circuits in the spinal cord contain all the necessary components to generate the locomotor rhythm and pattern, controlling intra- and interlimb coordination. Descending circuits from the brainstem then drive and select different aspects of locomotion.

The organization of these neural circuits is beginning to be elucidated as modern targeted genetic approaches enable our experimental collaborators to dissect the brainstem locomotor command circuitry into functionally distinct neuronal populations. Using these tools, key neuronal populations involved in the control of locomotor gait have been identified. A series of recent studies have also identified relevant populations and their up and downstream targets in the mesencephalic locomotor region and the reticulospinal system that control the speed and direction of locomotion.

However, the inherent complexity of the brainstem-spinal circuitry is difficult to capture with experimental methods alone. We, therefore, use computational modeling to complement experimental studies and investigate underlying mechanisms of brainstem-spinal locomotor control at the level of genetically defined neuronal populations and their interactions. We have developed a model of brainstem-spinal circuits that integrates experimental data from different labs and provides important insight into the organization and operation of spinal locomotor circuits and the supraspinal control of locomotion.

Monday, 11th March at 4 PM

In-Person:

Biocenter Cologne
Building 304; lecture hall 0.024,
Zülpicher Str. 47b, University of Cologne

Online:
https://uni-koeln.zoom.us/j/99888683196?pwd=ZGs1QXl2WVY4Njd2TS9xQ0NVVlFIdz09

Meeting-ID: 998 8868 3196
Passwort: 886127

Host

Prof. Dr. Graziana Gatto, Neurology Department. Sensorimotor Adaptation Group. University Hospital Cologne, www.gattolab.com