BDR SEMINAR (Kobe & online hybrid)

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Wednesday, October 26, 2022

16:00-17:00

1F Auditorium, DB Building C, Kobe / Broadcast online via Zoom

Zoom meeting URL will be announced on the event day by e-mail.

※Non-BDR members: Please register from the following link.
https://krs1.riken.jp/m/bdrseminarregistration (Registration deadline: Oct 21)

Neocortex-cerebellum learning algorithms

Summary

Cortex and cerebellum have jointly expanded over mammalian brain evolution, are linked by universal reciprocal connections, and together contain 99% of all neurons in humans. Cortico-cerebellar networks are functionally varied, but anatomically uniform. Thus, my lab's central goal is to identify a general-purpose cortico-cerebellar learning algorithm which can support diverse functional domains that share common circuit motifs. Our approaches include chronic multi-site two-photon imaging and optogenetics, electrophysiology, and computational modeling. In one line of inquiry, we aim to understand nonmotor behavior in the cerebellum, including reward-based learning, to identify processes common to both motor and nonmotor cortico-cerebellar function. Second, we are developing new ways to probe the dialogues among disparate cortico-cerebellar network elements, to understand how they learn to cooperate to achieve learning goals. Third, we are using our physiology data to constrain new computational models of cortico-cerebellar circuit function, with the long-term goal of explaining how the cortico-cerebellar circuit architecture supports a variety of both motor and nonmotor learning processes.

References:

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MJ Wagner, L Luo. Neocortex-cerebellum circuits for cognitive processing. Trends in Neurosciences 43(1), 42–54 (2020).

MJ Wagner, J Savall, TH Kim, MJ Schnitzer, L Luo. Skilled reaching tasks for head-fixed mice using a robotic manipulandum. Nature Protocols 15, 1237–1254 (2020).

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