NEURO GLOBAL
Seminar

Date & Time

March 19, 2025 (Wed) 11:00~12:30

(Including Q&A)

Speaker

Kathleen Cullen

Professor, Departments of Biomedical Engineering

Appointments with Neuroscience & Otolaryngology,

Johns Hopkins University

Title

Predictive coding during Natural Self-Motion: Implications for Perception & Action

Venue

Main Conference Room, 2 F Seiryo Hall, Seiryo Campus, Tohoku University

【MAP】https://www.tohoku.ac.jp/map/en/?f=SR_B10

Format Hybrid (On-site & Online)

Registration https://forms.gle/L3ZmQHVNmWBhxtucA

Related Website https://thecullenlab.org/

Reference ①https://www.nature.com/articles/s41467-024-48376-0 ② https://pubmed.ncbi.nlm.nih.gov/30914780/

●Neuro Globalプログラム生 (Neuro Global Program Students)

【脳科学セミナーシリーズEx】 【先進脳科学セミナーシリーズEx】 1 point

●医学系研究科(Graduate School of Medicine)

【医学履修課程】国際交流セミナー (アドバンスド講義科目)」 出席1回分

【Medical Science Doctoral Course】 International Interchange Seminar (Advanced Lecture course) 1 attendance

●生命科学研究科(Graduate School of Life Sciences)

【単位認定セミナー】 【イノベーションセミナー（留学生対象）】 2ポイント

【Credit-granted seminar】 【Innovation seminar (For international students)】 2 points

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NEURO GLOBAL
Seminar

Title

Predictive coding during Natural Self-Motion: Implications for Perception & Action

Abstract

Integrating sensory with motor signals during voluntary behavior is essential for distinguishing stimuli that are a consequence of intended actions from those that are externally generated. This ability enables the brain to flexibly fine-tune motor actions based on sensory feedback, a computation necessary for subjective awareness of the effects of movements. The lecture will explore the neural circuits that perform this computation, highlighting the cerebellum's role in building predictive models of self-generated movement as individuals explore the world. Our current research addresses several key questions: How does the cerebellum learn to interpret active motion as self-generated when the relationship between actual and expected sensory feedback changes? How does the vestibular cerebellum compute the expected consequences of self-motion, adapting predictions to changes in sensory feedback statistics and implementing them flexibly across contexts? Does cerebellum-mediated vestibular reafference suppression generalize to other natural self-motion behaviors, such as standing balance and its adaptation to perturbations? Our recent findings advance our understanding of how the cerebellum computes expected consequences of self-motion in everyday life, where predictions are learned, adapted, and flexibly implemented.

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