manitoba neuroscience network

Spontaneous activity , memory reply and default mode network

SEMINAR & VISITING SPEAKER SERIES

DATE

Monday, November 28, 2022
11:30 AM

LOCATION

Apotex Centre 164

SPEAKER

Majid Mohajerani, PhD
Associate Professor, Canadian Centre for Behavioural Neurosciences
University of Lethbridge

BIO

Majid Mohajerani, Ph.D., is an Associate Professor and Bryan Kolb Professorship Chair at the Canadian Centre for Behavioural Neuroscience, University of Lethbridge with a research focus on neural dynamics and particular emphasis on sensorimotor integration and memory systems. Prior to moving to the University of Lethbridge as an Alberta Innovation Chair in Healthy Brain Aging and Dementia, he was a postdoctoral researcher at the University of British Columbia. He combines optical imaging, electrophysiology, behavioural methods, and computational tools to study how different brain areas communicate with one another and how (a) memory is encoded and consolidated, (b) motor movement is generated based on sensory inputs. Website: lethbridge-braindynamics.com/majid-mohajerani; Twitter @mohajerani77

ABSTRACT

Spontaneous activity accounts for most of what the brain does and is likely to be key for information processing in the brain, but its function is still quite mysterious. Two key spontaneous activity processes are the Default Mode Network (DMN), a set of areas that are most markedly connected and active during behavioural idleness, and memory replay, the spontaneous reactivation of neural patterns occurring during experience. In the Mohajerani lab, we test the hypothesis that the DMN plays a key role in memory replay processes. This theory, if confirmed, would bring important conceptual advances: to memory studies, as it would provide a mechanism supporting the formation and consolidation of complex memory representations. I will explore this theory by our ongoing studies of neural activity over the whole mouse cortex in animals running memory tasks.

OBJECTIVES

1. Learn the latest discoveries on dynamic communication between brain regions or sub-regions at short time scales that support different functions in cognitive behaviours.

2. Learn state-of-the-art computational approaches for tracking non-random transient changes in any brain signals (LFP, Calcium imaging, Spike trains et al.) from any brain region or across the whole brain.

3. Learn how episodic memory are stored, and replayed within cortical network.

4. Learn state-of-the-art approaches for high-throughtput monitoring of brain activity, animal physiology and behaviour.

For more information:

T: 204-235-3939
E: info@manitobaneuroscience.ca

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