manitoba neuroscience network

Molecular mechanisms of synaptic plasticity and memory in health and disease

SEMINAR & VISITING SPEAKER SERIES

DATE Monday, March 18th, 2024

TIME 11:00 PM to 12:00 PM

LOCATION BSMB THEATRE C

SPEAKER

Zhengping Jia, PhD

Canada Research Chair (Tier 1), Senior Scientist, Neurosciences and Mental Health, The Hospital For Sick Children. Full Professor and Neuroscience Platform Director, Dept. of Physiology, Faculty of Medicine, University of Toronto

BIO

Dr. Jia obtained his Ph.D in Biology at Queen's University and did postdoctoral training at Mt Sinai Hospital, University of Toronto, Canada. Currently he is a Canada Research Chair (Tier 1) and Neuroscience Platform Director, Department of Physiology at University of Toronto. Dr. Jia is an international leader in studying neural plasticity, brain function and dysfunction.

ABSTRACT

Dr. Jia's research focuses on molecular and cellular processes involved in synaptic regulation and how these processes are dysregulated in pathological conditions. He uses a combination of multidisciplinary approaches and leading edge techniques including advanced conditional genetic manipulations, multiphoton imaging, opto/chemogenetics, whole-cell patch clamp recoding, proteomics, RNA-seq analysis and various behavioral tests. Specifically, three areas of research are conducted in Dr. Jia's lab. First, he studies molecules and signaling pathways required for long-term potentiation and depression, the most extensively studied forms of synaptic plasticity widely regarded as the cellular basis of learning and memory. Second, he identifies and manipulates synaptic and neural circuits involved in spatial and social memory and investigates how these networks are related to and interact with synaptic plasticity. Third, he examines whether and how synaptic plasticity and neural networks are dysregulated in animal models of brain disorders and develops compounds and tools to correct these dysregulations and improve brain function. His research is not only important for understanding the fundamental neurobiological basis of learning and learning, but also has potential to provide novel therapeutic strategies and molecular targets to treat cognitive and behavior impairments in various brain disorders such as autism, epilepsy and Alzheimer's disease.

OBJECTIVES

1. Introduction of Synaptic Plasticity: Long-term Potentiation and Long-term Depression

2. Actin and Rho Signaling in Spine Morphology and Plasticity

3. Glutamate Receptors in Synaptic Plasticity

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