manitoba neuroscience network

Molecular Logic of Synaptic Circuit Organization

NEUROSCIENCE GRAND ROUNDS

DATE
Friday, October 28, 2022
9:00AM

ZOOM LINK
https://us02web.zoom.us/j/85952605794

SPEAKER
Dr. Tabrez J. Siddiqui

Associate Professor of Physiology and Pathophysiology, Max Rady College of Medicine, University of Manitoba. Principle Investigaor, Children's Hospital Research Inistitute of Manitoba. Principle Investigator, Neuroscience Research Program,

Kleysen Institute for Advanced Medicine

BIO

As a graduate student, Dr. Tabrez Siddiqui trained as a biophysicist at the Max Planck Institute for Biophysical Chemistry in Goettingen, Germany. For postdoctoral work at the University of British Columbia, he worked on mechanisms of neuronal synapse development. His postdoctoral work has contributed immensely to understanding how glutamatergic synapses form and function in the brain. In 2014, Dr. Siddiqui joined the University of Manitoba where he is appointed in the department of physiology and pathophysiology. The Siddiqui lab is located at the Kleysen Institute for Advanced Medicine, where he is a principal investigator in the Neuroscience Research Program. The Siddiqui lab focuses on the roles of synaptic adhesion and scaffolding molecules in the development, maintenance, and plasticity of synapses and how these processes can be regulated in health and disease. Dr. Siddiqui has nurtured a multifaceted research program encompassing the molecular, systems, and behavioural branches of neuroscience. His work was recognized by the Canadian Association of Neuroscience which awarded him the Young Investigator Award in 2021.

RESEARCH

Synapse development requires adhesion of appropriate axons and dendrites, accompanied by local recruitment of presynaptic vesicle release machinery in axons and apposing neurotransmitter receptor signal transduction machinery in dendrites. These processes are coordinated by a class of trans-synaptic adhesion proteins known as synapse organizers. Synapse organizing proteins coordinate the broad spectrum of processes constituting synapse development, including formation and maintenance of synapses, as well as mediating experience-dependent changes in synaptic properties, a phenomenon known as synaptic plasticity.

Numerous mutations or copy number variations in genes encoding synapse organizers disrupt synaptic function and increase the risk for neuropsychiatric disorders such as autism and schizophrenia.

The goals of the Siddiqui research program are:

1. To determine the molecular mechanisms of synapse development and function in both the developing and mature brain

2. To determine the mechanisms governing long lasting changes in synaptic properties (plasticity)

3. To determine how synapses are specified and organized in the mammalian brain

4. To discover and test regulatory mechanisms governing synaptic function

The Siddiqui lab research program will generate fundamental knowledge of how neuronal circuits form and function and will open untapped lines of inquiry with strong potential to yield novel small molecule therapeutics targeting synapse organizers

OBJECTIVES

1. To gain insights into the mechanisms of neuronal circuit organization

2. To understand the context-dependent mechanisms of synaptic plasticity

3. To appreciate how synaptic dysfunction alters cognitive function and behaviour

For more information:

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

Health Sciences Centre Winnipeg
Hôpital St-Boniface Hospital RECHERCHE • RESEARCH
University of Manitoba