manitoba neuroscience network

Imaging the influences of sensory experience on visual system circuit development

SEMINAR & VISITING SPEAKER SERIES

WORLD WIDE NEURO PLATFORM

DATE

Monday, May 17, 2021
12:00 PM (noon) CST

WORLD WIDE NEURO LINK

https://www.crowdcast.io/e/mnnseminar_17may2021

MEETING ID & PASSCODE

None required

SPEAKER

Edward Ruthazer, PhD

Professor of Neurology & Neurosurgery
Associate Director McGill Integrated Program in Neuroscience Graduate Program

BIO

Dr. Ruthazer obtained his undergraduate degree from Princeton (1988) in Biology and East Asian studies and his PhD in Neuroscience was from the University of California at San Francisco (1996) working in the lab of Michael Stryker. After his PhD, Dr. Ruthazer received postdoctoral training as an NSF-JSPS International Research Fellow at Osaka University in Toyonaka Japan (1997-1998) then at Cold Spring Harbor Laboratory in the laboratory of Dr. Holly Cline.

Dr. Ruthazer has been a professor in the Department of Neurology and Neurosurgery at McGill University and the Montreal Neurological Institute-Hospital since 2005. He held the Canada Research Chair (tier 2) in Neuronal Circuit Development from 2005 to 2015 and the FRSQ chaire de recherche from 2015-2019. He has been a full professor since 2016. In 2011 he received the CAN Young Investigator Award for research excellence. He is also a member of the Azrieli Centre for Autism Research and the Centre for Research in Neuroscience at McGill. In 2009 he founded the McGill Integrated Program in Neuroscience Graduate Rotation Program, which he still heads today. He has been Associate Director of the IPN since 2015. He was Secretary of the Canadian Association for Neuroscience from 2016 to 2018. His laboratory at the Montreal Neurological Institute studies experience-dependent structural and functional plasticity of the developing visual system in Xenopus and zebrafish models as well as synaptic plasticity mechanisms in mice and frogs. Neuron-glia interactions are another important focus of their work.

RESEARCH

Using a combination of in vivo imaging of neuronal circuit functional and structural dynamics, we have investigated the mechanisms by which patterned neural activity and sensory experience alter connectivity in the developing brain. We have identified, in addition to the long-hypothesized Hebbian structural plasticity mechanisms, a kind of plasticity induced by the absence of correlated firing that we dubbed "Stentian plasticity". In the talk I will discuss the phenomenology and some mechanistic insights regarding Stentian mechanisms in brain development. Further, I will show how glia may have a key role in circuit remodeling during development. These studies have led us to an appreciation of the importance of neuron-glia interactions in early development and the ability of patterned activity to guide circuit wiring.

OBJECTIVES

1. Understand the contributions of sensory experience and neural activity on circuit refinement

2.Appreciate the benefits of diverse animal models for study of brain development

3. Appreciate the importance of glia in the process of activity-dependent circuit refinement.

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