manitoba neuroscience network

Mechanisms of Axon Growth and Regeneration

SEMINAR & VISITING SPEAKER SERIES

WORLD WIDE NEURO PLATFORM

DATE

Monday, January 17, 2022
12:00 PM (noon) CST

WORLD WIDE NEURO LINK

https://www.crowdcast.io/e/mnn-seminar_17Jan22_FB

MEETING ID & PASSCODE

None required

SPEAKER

Prof. Frank Bradke, PhD

Senior Group Leader and Full Professor
Axon Growth and Regeneration
German Center for Neurodegenerative Diseases (DZNE)

BIO

After studying at the Freie Universität Berlin and University College London, Bradke carried out research at the European Molecular Biology Laboratory (EMBL) in Heidelberg as part of his doctoral thesis. As a postdoctoral researcher, he moved to the University of California in San Francisco and Stanford University in 2000. In 2003, he was appointed a group leader at the Max Planck Institute of Neurobiology in Martinsried. In 2011, he was awarded the IRP Schellenberg Prize, one of the most prestigious awards in the field of regeneration research. In the same year he became full professor at the University of Bonn, and was appointed head of the Axon Growth and Regeneration research group at the DZNE. Bradke is an elected a member of the Leopoldina (the German National Academy of Sciences), the Academia Europaea, and the European Molecular Biology Organization (EMBO). In 2016, he was awarded the Leibniz Prize, which is the most important research award in Germany. In 2018, he received the Roger de Spoelberch Prize and in 2021 he was selected for the Carl Zeiss Lecture.

RESEARCH

Almost everybody that has seen neurons under a microscope for the first time is fascinated by their beauty and their complex shape. Early on during development, however, there are hardly any signs of their future complexity, but the neurons look round and simple. How do neurons develop their sophisticated structure? How do they initially generate domains that later have distinct function within neuronal circuits, such as the axon? And, can a better understanding of the underlying developmental mechanisms help us in pathological conditions, such as a spinal cord injury, to induce axons to regenerate?

Here, I will talk about the cytoskeleton as a driving force for neuronal polarization. We will then explore how cytoskeletal changes help to reactivate the growth program of injured CNS axons to elicit axon regeneration after a spinal cord injury. Finally, we will discuss whether axon growth and synapse formation may be processes in neurons that might exclude each other. Following this developmental hypothesis, it will help us to generate a novel perspective on regeneration failure in the adult CNS, and how we can overcome this failure to induce axon regeneration. Thus, this talk will describe how we can exploit developmental mechanisms to induce axon regeneration after a spinal cord injury.

OBJECTIVES

1. Clearing the injured spinal cord enables the tracking of the trajectories of regenerating axons.

2. Manipulating the neuronal cytoskeleton enables axon regeneration

3. Adult CNS Neurons are growth incompetent because they are in a synaptic state.

For more information:

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

Health Sciences Centre Winnipeg

Hôpital St-Boniface Hospital RECHERCHE • RESEARCH

University of Manitoba