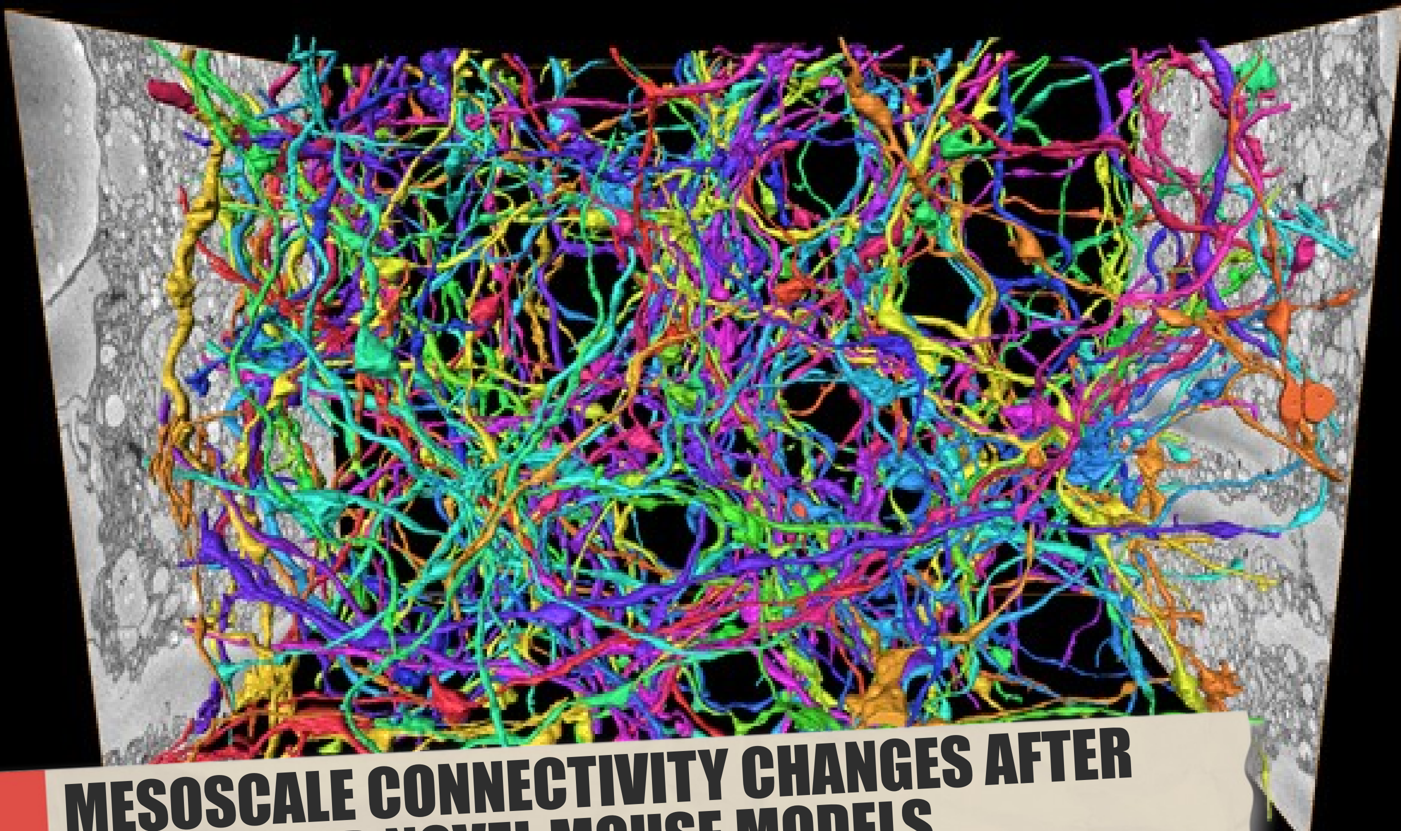

MESOSCALE CONNECTIVITY CHANGES AFTER STROKE AND NOVEL MOUSE MODELS

A TALK BY

TIMOTHY MURPHY

DEPT. OF PSYCHIATRY
UNIVERSITY OF
BRITISH COLUMBIA

07

MAGGIO

17:00

https://bit.ly/2yBBpN9

SEMINARIO IN MODALITA' TELEMATICA

New approaches to real-time assessment and closed-loop feedback based on behavioral features or brain activity will be discussed in the lecture that are designed to optimize stroke recovery interventions in mice for insight into better approaches for human recovery. While mice have been used in the past, the behavioral methods for assessing stroke recovery had poor alignment with brain activity itself. We develop cages where mice can be continuously housed and assessed using high throughput methods. These methods will allow us to precisely, on a millisecond timescale, evaluate mice reaching for water drops while assessing and manipulating cortical activity. Preliminary results indicate that water reaching represents a sensitive method of examining forelimb-related stroke deficits that have parallels to those experienced in patients. This system, while sophisticated, is designed to work automatically within the animal room enabling continuous assessment of the stroke recovery process. We report a fully automated homecage-based system that identifies, and rewards mice while permitting the collection of mesoscale functional connectivity data using genetically encoded indicators. The goal of this work is to have fully automated metrics for stroke recovery. A recurring theme in datasets from these mesoscale assessment methods is engagement of wide-scale cortical regions during even relatively simple licking tasks. In a similar manner we have previously observed that stroke-induced deficits can be widely distributed. We observed a widespread depression of optogenetically evoked activity that extended to the non-injured hemisphere; by 8 weeks, significant recovery was observed. In our automated systems simultaneous measurement of mouse behavior and mesoscale brain imaging revealed that body movements contribute significantly to much of on-going and task related brain activity in awake mice.

TIMOTHY H. MURPHY is full Professor at Department of Psychiatry, University of British Columbia, Vancouver. The central focus of his lab is in understanding how cortical activity flow impacts normal brain function and diseases of the nervous system. His laboratory contributes to understanding how mouse cortex adapts after stroke, resulting in remapping of brain function from damaged to surviving areas using mouse models. The lab has developed new imaging and optogenetic tools that have parallels to human brain imaging and stimulation tools. Surprisingly, recovery not only involves functionally related circuits, but also network wide changes in connection weights.

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