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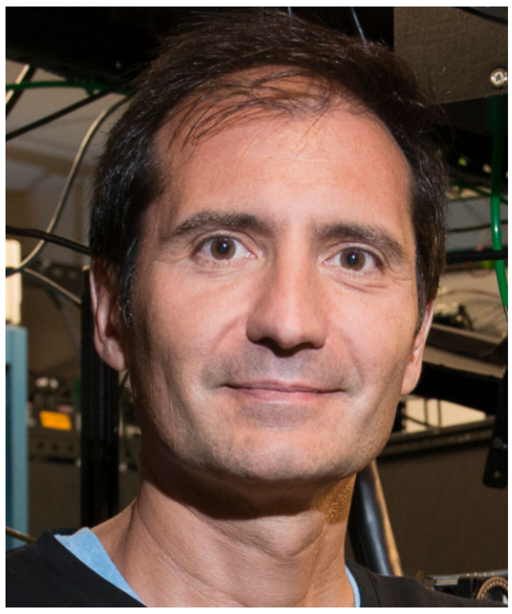

Basal ganglia output pathways for selection amongst incompatible action

SEMINAR & VISITING SPEAKER SERIES

WORLD WIDE NEURO PLATFORM

DATE

Monday, May 9, 2022

12:00 PM CST

WORLD WIDE NEURO LINK

This talk willl be hosted on zoom:

https://umanitoba.zoom.us/j/63039286006?pwd=cHZvbkNCR1dtbG5hNUUrM3I2Y2NuZz09

MEETING ID 630 3928 6006

PASSCODE 794044

SPEAKER

Dr. Bernardo Sabatini, MD, PhD

Alice and Rodman W. Moorhead III Professor of Neurobiology, Harvard Medical School

Investigator, Howard Hughes Medical Institute (HHMI)

BIO

Bernardo Sabatini's research examines the mechanisms by which animals choose what to do next. This process of "action selection" uses information from past experiences, current goals, internal needs, and the current state of the environment to choose an action that achieves near- and long-term objectives, such as access to food, water, mates, and safety from predators. An evolutionarily ancient part of the brain, the basal ganglia, is conserved from fish to humans and mediates action selection. Sabatini and his collaborators study the basal ganglia to uncover the circuits that underlie action selection, and that allow an animal to update its action plan dependent on past experiences. To facilitate their studies, the Sabatini group develops novel optical, behavioral, and mathematical methods. Sabatini is a Howard Hughes Medical Institute Investigator as well as an elected member of the American Academy of Arts and Sciences and the National Academy of Sciences. He earned his MD and PhD from Harvard Medical School and the Harvard-MIT Program in Health Sciences and Technology.

RESEARCH

In the basal ganglia (BG), anatomically segregated and topographically-organized feedforward circuits are thought to modulate multiple behaviors in parallel. Inherent in this model is the assumption that there is a correspondence between anatomically and functionally defined circuits within and through the BG. Furthermore, layered on this model is the proposal that the direct and indirect pathways act together to select one behavior while repressing others. I will discuss recent results obtained with a variety of anatomical and optogenetic approaches that dissect functionally and anatomically defined pathways in the BG of mice. Our results confirm the parallel model of BG function, and suggest that the integration and competition of information relating to different behavior occurs largely outside of the BG. Indeed, follow-up studies indicated that, for lateralized and incompatible actions such as licking, this competition occurs in the BG output and its targets, such as the superior colliculus. Pathways-specific manipulations of the direct and indirect pathway in the BG indicate the these structures in each side of the brain control the colliculus bilaterally to simultaneously regulate incompatible ipsiversive and contraversive movements.

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