ELSC Seminar: Bruce Hope - Dec. 15, 2016 at 17:00

December 15, 2016

Fos-expressing ensembles in operant learned responding for food and drug rewards

ELSC cordially invites you to the lecture given by:

Bruce Hope

Behavioral Neuroscience Branch, IRP/NIDA/NIH

On the topic of:

Fos-expressing ensembles in operant learned responding for food and drug rewards

The lecture will be held on Thursday December 15th, at 17:00

at ELSC: Silberman Bldg., 3rd Wing, 8th Floor,

Edmond J. Safra Campus

Light refreshments served at 16:45

Abstract:

We assess the neural mechanisms of learned associations in operant-learned behaviors. These learned associations or memories involve complex sets of highly specific information that must be stored with a high degree of resolution. In contrast, most studies to date examined low resolution neural mechanisms in whole brain areas, cell types or randomly selected neurons regardless of whether they were activated and
participated in the behavior. Instead, high resolution memories are thought to be stored by alterations
induced selectively within sparsely distributed patterns of neurons, called neuronal ensembles, that are
selectively activated by cues relevant to the memory. We developed the Daun02 inactivation procedure
with transgenic FosLacZ rats to demonstrate that different patterns of strongly activated Fos-expressing
ensembles mediate different memories. Since these ensembles encode the memory, we developed
methods that use (1) FACS to discover multiple molecular alterations and (2) FosGFP transgenic rats to
discover multiple electrophysiological alterations that are induced only within Fos-expressing neurons. We
have since developed a Fos-Tet-Cre transgenic rat system that allows us to selectively manipulate these
alterations within Fos-expressing ensembles to assess whether they play a causal role in operant learned
behaviors. It is our hope that a focus on the behaviorally activated ensembles that store the memories will
permit more focused novel treatments of behavioral disorders.

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