



PRINCIPE FELIPE
CENTRO DE INVESTIGACION

CIPF Seminar

Inhibitory hippocampal neurotransmission shapes memory encoding

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Laboratory of inhibitory microcircuits

Cajal Institute (CSIC)

Date: **22/11/19- 12:30h**

Place: Salón de Actos CIPF

Abstract Neuronal ensembles are responsible of the storage and recall of memories of past events. However, little is known about network mechanisms that select and integrate subpopulations of neurons in a specific cellular ensemble. The results I will present in this seminar show that memory is competitively distributed among groups of excitatory neurons according to their own level of activity and that of neighboring cells at the time of training. Ensembles of active neurons inhibit surrounding neurons and become involved in the memory trace by engaging inhibitory microcircuits formed by dendrite targeting interneurons. Somatostatin-expressing inhibitory neurons control the size of the engram and the stability of long-term memories. These findings suggest that memory is distributed among excitatory cells of the hippocampus through an activity dependent process of mutual inhibition mediated by somatostatin expressing dendritic targeting interneurons.

<http://www.cajal.csic.es/departamentos/pablo-mendez/datos.html>

The laboratory investigates the role of inhibitory microcircuits in the inhibitory neurons to regulate brain functions such as learning and memory. Lab goals are:

1. Understand how memory formation modifies inhibitory cortical circuits
2. Determine the role of inhibitory synaptic plasticity in memory consolidation and extinction
3. Define how Alzheimer disease alters the function of hippocampal inhibitory microcircuits

The laboratory applies technology for electrophysiological and optical recording of electric neuronal activity to the study of inhibitory synapse physiology. Optogenetic techniques are used to study synaptic plasticity mechanisms and define the role of specific inhibitory neuronal populations in behaviour.

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