



SEMINARIO PRESENCIAL

Viernes, 17 de Marzo de 2023

12:30 h. Instituto Cajal (CSIC) Madrid

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MADRID, ESPAÑA

The multifaceted effects of sex in the brain

Abstract

Multiple aspects of brain anatomy and function are deeply influenced by sex. The brain of male and female individuals not only differs in the sex hormonal milieu in which it is immersed but also in the sex chromosome complement all brain cells carry in their nuclei. Moreover, the brain is also capable of producing sex hormones that act locally to regulate gene expression, synaptic plasticity neuronal excitability and network function. In my talk I will illustrate the multifaceted effects of sex in the brain focusing and dissecting its impact in the physiology of the diverse neuronal classes, excitatory and inhibitory, that populate the hippocampus. I will provide the first description of a sex-specific control of hippocampal inhibitory neurons. The results I will present suggest that sex-related mechanisms are part of the basic mechanisms supporting hippocampal-dependent memory and highlight the importance of addressing sex differences in basic and applied neuroscience research.

Affiliation and short bio

2000-2005 Estudiante Ph.D, Instituto Cajal (CSIC) Madrid, España.

2005-2007 Asistente posdoctoral, Universidad de Ginebra, Suiza.

2008-2011 Asistente posdoctoral. European Brain Research Institute, Roma, Italia.

2012-2017 Asistente posdoctoral Senior, Universidad de Ginebra, Suiza.

2017-2020 Investigador RyC, Instituto Cajal (CSIC), Madrid.

2020- Científico titular OEP 2017.

My laboratory studies the neuromodulation and function of hippocampal inhibitory neurons.

We explore two main research lines:

- 1) Role of hippocampal inhibitory neurons (IN) in memory encoding, retrieval and extinction. I use specific types of genetically, anatomically and functionally defined IN, optogenetics, electrophysiology and memory test in mice to unravel the mechanisms used by IN of the hippocampus, a key region for memory formation, to store and maintain our memories.
- 2) Hormonal regulation of inhibitory neuron function. Brain networks are controlled by a wide array of neuromodulatory molecules. Among them, estradiol, the main feminine sex hormone, is a potent regulator of neuronal function. In the laboratory, we have characterized the regulation of hippocampal IN by estradiol produced within the brain using a combination of molecular, genetic, behavioral and functional tools (in vivo and in vitro electrophysiology and fiber photometry).

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Related publications with the topic:

Sex-specific regulation of inhibition and network activity by local aromatase in the mouse hippocampus.

Hernández-Vivanco A, Cano-Adamuz N, Sánchez-Aguilera A, González-Alonso A, Rodríguez-Fernández A, Azcoitia Í, de la Prida LM, Méndez P. Nat Commun. 2022 Jul 7;13(1):3913. doi: 10.1038/s41467-022-31635-3. PMID: 35798748

Synthesis and impact of neuroestradiol on hippocampal neuronal networks.

Azcoitia I, Hernández-Vivanco A, Cano-Adamuz N, Méndez P. Current Opinion in Endocrine and Metabolic Research 2022, 24: 100335 <https://doi.org/10.1016/j.coemr.2022.100335>.