



## SEMINARIO PRESENCIAL

Viernes, 29 de abril de 2022

12:30 h. Instituto Cajal (CSIC) Madrid

### **DRA. GERTRUDIS PEREA**

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# GABAergic-astrocyte signalling helps decision-making

## **Abstract**

Interneurons and GABAergic activity play a fundamental role for precise control of brain networks coordination and animal behaviour. Astrocytes have relevant roles in synaptic transmission and plasticity by sensing synaptically released neurotransmitters, including GABA. However, the GABAergic control of astrocyte-neuron communication in brain circuits and its behavioural outcome are still poorly defined. Therefore, we will discuss recent data showing how GABAergic signaling in astrocytes enables the temporally accurate excitation/inhibition balance in prefrontal cortical circuits, driving correct animal performance. As a result, we will propose the existence of functional GABAergic units established between cortical interneurons and astrocytes, which tune the prefrontal cortex operation modes that dictate goal-directed behaviours.

## **Affiliation and short bio**

Gertrudis Perea is staff scientist at the Spanish National Research Council (CSIC) and Head of Neuron-Glia Networks Lab at the Cajal Institute (Madrid, Spain). She received her PhD in 2006 in Neuroscience, at the Autonomous University of Madrid (UAM), Spain with Prof. Araque. She performed her post-doctoral training from 2007 to 2013 at the Cajal Institute with Prof. Araque, and at the Picower Institute for Learning and Memory (MIT, Cambridge, USA) with Prof. Mriganka Sur. Since 2014 she works as a principal investigator at the Department of Functional and Systems Neurobiology, Cajal Institute. Perea lab is focused in understanding the role of astrocytes in the neural coding underlying brain activity and complex animal behaviors. Her results have contributed to consolidate the concept of Tripartite Synapse in Neuroscience, showing that astrocytes modulate neuronal activity targeting presynaptic and postsynaptic receptors, being involved in plasticity processes. Combining molecular approaches, electrophysiology, imaging techniques, optogenetics and behavioral studies, she investigates the astrocytic impact to the synaptic and circuits function in health and neurological disorders. She was Vice-President of the Spanish Society for Neuroscience (2019-2021). She is editorial board member of *Glia*, *Frontiers in Cellular Neuroscience - Non-Neuronal Cells*, *Brain Sciences - NeuroGlia* section.

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### **Related publications with the topic:**

1- Mederos S et al. (2021). GABAergic signaling to astrocytes in the prefrontal cortex sustains goal directed behaviors. **Nature Neuroscience**. 24(1):82-92. doi: 10.1038/s41593-020-00752-x.

2- Mederos S et al. (2019). Melanopsin for precise optogenetic activation of astrocyte-neuron networks. **GLIA**. doi: 10.1002/glia.23580.

3- Mederos S, Perea G. (2019). GABAergic-astrocyte signaling: A refinement of inhibitory brain networks. **GLIA**. 67(10):1842-1851. doi: 10.1002/glia.23644.