



SEMINARIO PRESENCIAL

Viernes, 11 de febrero de 2022
12:30 h. Instituto Cajal (CSIC) Madrid

PABLO GARCÍA-JUNCO CLEMENTE

DPTO. FISIOLÓGIA MÉDICA Y BIOFÍSICA
INSTITUTO DE BIOMEDICINA - IBI
Sevilla

Neuromodulatory control of cortical interneurons revealed by two-photon imaging

Abstract

Cortical processing engages the interaction between excitatory and inhibitory neurons. Synaptic inhibition has been shown as a key player to head spontaneous and sensory-driven activity in the cerebral cortex, and it's generated by interneurons reciprocally connected to other cortical neurons. Interneurons expressing parvalbumin (PV), somatostatin (SOM) and vasoactive intestinal peptide (VIP) are the three largest and non-overlapping classes of interneurons in the mouse cortex. *In vitro* studies have shown cortical interactions between these groups of interneurons and their excitatory partners, but the functional meaning of the connections is poorly understood. An important question in systems neuroscience is how behavioral state modulates the processing of sensory signals. To gain further insights into the impact of behavioral state on local cortical circuitry, we employ an approach based on resonant scanning 2-photon imaging of large populations of identified cortical neurons in frontal cortex of behaving mice. Genetically encoded calcium indicators were used to image activity of excitatory and inhibitory neurons, using cell type specific CRE-driver lines that also expressed a red fluorescent protein.

Affiliation and short bio

Pablo García-Junco Clemente is a Ramón y Cajal researcher in the Department of Medical Physiology and Biophysics at the University of Seville. He carries out his research work at the Instituto de Biomedicina de Sevilla (IBiS). His scientific career has focused on the field of Neuroscience to get a deeper understanding of synaptic communication mechanisms, from single neurons to circuit level. Graduated in Biological Sciences (University of Seville, 2001), he later completed his PhD in the Department of Medical Physiology and Biophysics, to elucidate the role of chaperons to maintain the functional integrity of the synaptic terminals (2008). He moved to the University of California Los Angeles (UCLA) for a postdoctoral stay in the laboratory of Prof. Joshua Trachtenberg, where he specialized in *in vivo* functional imaging techniques in awake animals using multiphoton microscopy. In 2016 he returned to the University of Seville to carry out his research work at the IBiS. In 2017 he obtained a contract from the Ramón y Cajal program, establishing a new research line regarding inhibitory control of cortical activity in health and disease.

Instituto Cajal. CSIC

Avda. Doctor Arce, 37. 28002. Madrid. Tel. 91 585 4750



www.cajal.csic.es

Related publications with the topic:

Pablo Garcia-Junco Clemente; Elaine Tring; Dario Ringach; Joshua Trachtenberg. 2019. State-Dependent Subnetworks of Parvalbumin-Expressing Interneurons in Neocortex. Cell Reports. Cell Press. 26(9), pp.2282-2288.

Pablo Garcia-Junco Clemente; Taruna Ikrar; Elaine Tring; Xianming Xu; Dario Ringach; Joshua Trachtenberg. 2017. An inhibitory pull–push circuit in frontal cortex Nature Neuroscience. NPG 23/01/2017.

Ringach, DL.; Mineault, PJ.; Tring, E.; Olivas, ND.; Garcia Junco- Clemente, P.; Trachtenberg, JT.2016. Spatial clustering of tuning in mouse primary visual cortex. Nature communications. NPG. 7, pp.12270. ISSN 2041-1723.