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P0068 / #1800

Topic: AS01 Nervous System Development and Related Disorders

## SEXUAL DIMORPHISM IN THE OTP-EXPRESSING NEURONS OF THE MEDIAL EXTENDED AMYGDALA

Alba González-Alonso<sup>1,2</sup>, Lorena Morales<sup>1,2</sup>,  
Alessandra Pross<sup>1,2</sup>, Loreta Medina<sup>1,2</sup>,  
Ester Desfilis<sup>1,2</sup>

<sup>1</sup> University of Lleida, Experimental Medicine, Lleida, Spain

<sup>2</sup> IRB Lleida - Fundació Josep Pifarré, Evolutionary Developmental Neurobiology, Lleida, Spain

Social behaviors and their disorders, such as autism spectrum disorder, show strong variations between sexes. The medial extended amygdala (EAmE) is one of the major brain regions involved in these sexually dimorphic behaviors and shows anatomical (volume, cell number, neuron complexity) and molecular differences between males and females in many species. In the mouse, such differences are subtle and became evident when studying distinct molecularly defined neuron subpopulations. These studies were mainly focused on the GABAergic neurons of EAmE controlling mating and aggression. However, the EAmE also contains an important subpopulation of glutamatergic neurons. Recently, our group found that most of these neurons originate in a new radial embryonic domain of the forebrain that coexpresses the transcription factors *Foxg1* and *Otp*. Our aim was to investigate if these neurons present sexual dimorphism in volume, cell number and expression of gonadal hormones' receptors. To that aim, we used an *Otp-eGFP* transgenic mouse, with permanent labelling of *Otp* neurons and their projections. To visualize the cells, we used immunohistochemistry against GFP and analyzed the images with Fiji Image J. We also studied the expression of gonadal hormones' receptors by combining fluorescent in situ hybridization with immunofluorescence for GFP and by qRT-PCR. We observed that in the posterodorsal medial amygdala (MePD), a subnucleus well known for regulating sexual behavior, the volume occupied by *Otp* neurons is significantly larger in males than in females, but there were no differences in cell number and labelling ratio. Moreover, we also observed that the majority of the *Otp* neurons of the EAmE express estrogen and androgen receptors in both sexes. Our results suggest that *Otp* cells of the mouse MePD might be involved in sexually dimorphic behaviors. Funding: Ministerio de Ciencia e Innovación (PID2019-108725RB-I00) and predoctoral fellowship FI AGAUR (2021 FI\_B00353).

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## CANDIDATE AUTISM GENE NRX1 LEADS TO ECTOPIC SYNAPSES IN NOCICEPTIVE NEURONS IN DROSOPHILA LARVAE

Claudia Gualtieri, Fernando Vonhoff

University of Maryland Baltimore County, Biological Sciences, Baltimore, United States of America

Synaptic pruning is a neuroplastic process leading to the withdrawal of ectopic synapses formed during the initial phases of

neuronal development. Extensive research has shown evidence of synaptic pruning occurring in both the central nervous system (CNS) and peripheral nervous system (PNS). However, the molecular mechanisms underlying synaptic pruning remain incompletely understood. The process of synapse pruning is crucial during development in multiple organisms as it has also been linked to the onset of neurodevelopmental disorders like autism. We determined the anatomical effects of candidate autism genes *in vivo* using the *Drosophila* model. Starting from the hypothesis that candidate autism genes would lead to the presence of ectopic synapses that branch off stereotypic connectivity patterns, we assessed the stereotypic synaptic innervations of cIV nociceptive sensory neurons development. The candidate autism genes of the transsynaptic adhesion proteins neurexin-1 and neuroligin-3 were downregulated using RNAi constructs. Anatomical defects were assessed by counting the number of ectopic neurites. Data shows increased number of ectopic neurites in the stereotypic ladder structure formed in the CNS by the axonal projection of nociceptive neurons when the candidate autism gene neurexin-1 is downregulated. Additionally, we are in the process of assessing the synaptic connectivity between cIV sensory neurons and the postsynaptic basin interneurons during embryonic and larval development using the GFP Reconstitution Across Synaptic Partners (GRASP) technique. This data will reveal the synaptic partnership between nociceptors and basin interneurons -1 and -4 at different stages of *Drosophila* development. Also, it will provide the groundwork for determining the potential role of synaptic pruning on the synaptic connectivity of nociceptors to basins, offering the setting for future pruning disruption investigations. Our findings will offer the basis for investigating the processes leading to the failure in the elimination of ectopic synapses providing insights into the molecular mechanisms regulating synaptic refinement.

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Topic: AS01 Nervous System Development and Related Disorders

## PREVALENCE, DISTRIBUTION AND CLINICAL FEATURES OF PSYCHIATRIC COMORBIDITIES IN CHILDREN AND ADOLESCENTS WITH AUTISM SPECTRUM DISORDER

Silvia Guerrero, Elisa Fuca', Giovanni Valeri,  
Laura Casula, Vittoria Celentano, Deny Menghini,  
Stefano Vicari

Bambino Gesù Children's Hospital, IRCCS, Child And Adolescent Neuropsychiatry Unit, Rome, Italy

The high frequency of co-occurring psychiatric disorders in children and adolescents with autism spectrum disorder (ASD) has been widely demonstrated in the literature. Four hundred seventy-two children and adolescents with ASD (3-18 years) were included in a study designed to assess its prevalence and distribution by examining individual and clinical characteristics of the sample. Thirty-two percent of the participants had a co-occurring psychiatric condition (ASD/PSY group). Attention-deficit/hyperactivity disorder (ADHD) was the most frequent diagnosis among preschoolers; among school-age children, ADHD and anxiety/obsessive-compulsive disorders were the most frequent conditions; finally, adolescents show a higher prevalence of anxiety/obsessive-compulsive disorders. Significant differences in individual and clinical characteristics emerged between participants with and without co-occurring