BOOK OF
ABSTRACTS

Organização

U.PORTO

Apoio

INVESTIGAÇÃO JOVEM DA UNIVERSIDADE DO PORTO

TÍTULO | *TITLE*

Livro de Resumos do 17.º Encontro de Investigação Jovem da U.Porto / *Book of Abstracts Young Researchers Meeting of U.Porto*

Universidade do Porto

Vice-Reitor para a investigação e Inovação

Professor Doutor Pedro Rodrigues

ijup@reit.up.pt

ISBN

978-989-746-378-5

Design

Serviço de Comunicação e Imagem da U.Porto

21647 | Deciphering neuroimmune interactions in alcohol intake in mouse model of intermittent access in male and female

Raquel Pacheco[1,2]; Teresa Canedo [1,3]; Ana M. Rodrigues [1,4]; Joana Moreira [5,6]; João B. Relvas [4,5]; Renato Socodato [5]; Teresa Summavielle [1,6]

i3S – Instituto de Investigação e Inovação em Saúde, Addiction Biology Lab[1]; Faculdade de Ciências da Universidade do Porto[2]; ICVS, Universidade do Minho[3]; Faculdade de Medicina da Universidade do Porto[4]; i3S – Instituto de Investigação e Inovação em Saúde, Glial Cell Biology Lab[5]; Instituto de Ciências Biomédicas de Abel Salazar, Universidade do Porto[4]; Escola Superior de Saúde do Politécnico do Porto[6]

Background & Aim: Excessive alcohol consumption continues to pose a significant global health challenge, with detrimental effects on millions of individuals. Our laboratory has shown that alcohol exposure triggers reactive changes in astrocytes, including alterations in gene expression, activity, and proliferation, while also affecting microglial morphology and immune responses (1). We are to characterizing the effects of chronic alcohol consumption using a well-established voluntary alcohol drinking model in adult mice, to investigate the impact of chronic alcohol exposure on the prefrontal cortex (PFC), focusing on glial cell morphology, synaptic density, and behaviour. **Methods:** Mice are exposed to intermittent "every-other-day" (EOD) access to alcohol 15% (v/v) for 3 weeks, and behaviourally tested for anxiety, depression and memory, before sacrifice at 21 days of alcohol, or at 7 days of withdrawal. Brains were processed for glial cell analysis. **Results:** Our preliminary findings revealed sex-specific responses following chronic alcohol exposure. Male mice exhibited increased astrocyte volume in the ventromedial PFC (vmPFC) and hyper-ramification in the ventrolateral PFC (vlPFC), whereas females displayed reductions in astrocyte size and complexity. Microglia morphology also differed between sexes, with females showing increased cell volume and males displaying reduced microglial volume in the vlPFC. These results suggest distinctive immune and synaptic responses to ethanol in males and females. Of note, we observed heightened inhibitory synapse density in the male PFC, while females exhibited increased excitatory synapse density. We are now conducting a proteomic analysis of PFC synaptosomes to identify important molecular targets in the crosstalk between neuros and glial cells. **Conclusions:** With this work we expect to clarify the complex interplay between chronic ethanol exposure, sex, and PFC function, find also new targets for innovative therapeutic approaches.

Keywords: Alcohol Use, Neuroinflammation, Sex Differences.

Acknowledgments

This work was funded by National Funds through FCT—Fundação para a Ciência e a Tecnologia, I.P., under the project PTDC/SAU-TOX/0067/2021.

References:

[1] Socodato, R., Henriques, J. F., Portugal, C. C., Almeida, T. O., Tedim-Moreira, J., Alves, R. L., Canedo, T., Silva, C., Magalhaes, A., Summavielle, T., & Relvas, J. B. (2020). Daily alcohol intake triggers aberrant synaptic pruning leading to synapse loss and anxiety-like behaviour. *Sci Signal*, *13*(650), eaba5754. https://doi.org/https://doi.org/10.1126/scisignal.aba5754