Effects of chronic stress on hippocampal microglia and neurogenesis of mice under social defeat stress.

Jose Munoz-Martin[1], Maria Inmaculada Infantes-Lopez[1,2], Patricia Chaves-Peña[1], Andrea Nieto-Quero[2,3], Emma Zambrana-Infantes[2,3], Carmen Pedraza[2,3], Margarita Perez-Martin[1,2]

[1]University of Málaga, Department of Cell Biology, Genetics and Physiology, Málaga, Spain.

[2]Biomedical Research Institute of Malaga (IBIMA), Neurosciences, Málaga, Spain.

[3]University of Málaga, Department of Psychobiology and Methodologies of Behavioural Sciences, Málaga, Spain.

Introduction: Chronic stress is the main environmental factor in the aetiology of depression and it is known that this type of stress may cause alterations in brain regions such as the hippocampus. Nevertheless, changes in a cellular basis are still a subject of study. **Objective:** The analysis of microglial cells and immature neurons in the dentate gyrus (DG) of stressed mice. **Methods:** C57BL/6J mice were subjected to Social Defeat Stress model (SDS), consisting of 6 days of social isolation prior to 10 days of stressor. The DG was analysed using immunohistochemistry techniques against Iba1 (microglia) and DCX (immature neurons) following image analysis (ImageJ) to obtain morphological and distribution data of microglial somas. Furthermore, hippocampal neurogenesis was assessed through stereological quantification of DCX+ cells (Visiopharm). **Results:** An increase in soma size under chronic stress conditions was shown, as well as a less circular and more ameboid soma. These changes were observed mainly in the infrapyramidal blade of the DG. According to microglial cells distribution parameters, the granular cell layer (GCL) was the region which presented the highest microglial density under SDS. Regarding hippocampal neurogenesis, a decrease in the number of DCX+ Type 2-3 cells was observed in the whole DG. **Conclusion:** All these results o!er a more profound insight of stress changes at a cellular level and could contribute to a better understanding of neurobiological basis in pathologies such as depression. **Projects:** PSI2017-83408-P (MINECO) and P20 00460 (Consejería de Conocimiento, Investigación y Universidades, Junta de Andalucía). **University of Málaga.**

Funding:

University of Málaga and the projects PID2020-117464RB I00/ AEI/10.13039/501100011033 to Pedraza C. and Pérez-Martin M., PSI2017-83408-P (FEDER/ Ministerio de Ciencia, Innovación y Universidades, Spain) to Pedraza C., UMA20- FEDERJA-112 (FEDER/Junta de Andalucía) to Pedraza C. and Pérez-Martin M. and P20-00460 (Consejería de Conocimiento, Investigación y Universidades, Junta de Andalucía) to Pedraza C. Predoctoral Fellowship: FPU16/05308 to Nieto-Quero A. and FPU19/03629 to Infantes-López MI., Ayuda A.2 para Contrato Predoctoral Del I Plan Propio de Investigación, Transferencia y Divulgación Científica de la Universidad de Málaga, Convocatoria 2021 to Munoz-Martin J.