

Group Name: Translationa Imaging Biomarkers

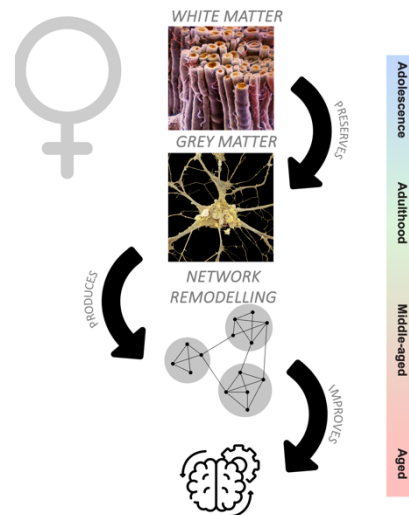
IP Name: Silvia De Santis

Group Web: <https://in.umh-csic.es/en/grupos/translational-imaging-biomarkers/>

Title of the MRP: Understanding the role of sexual hormones in defining healthy ageing trajectories of brain microstructure

Summary of the MRP:

This project aims to investigate the role of sexual hormones in shaping healthy brain ageing trajectories, with a particular focus on their neuroprotective effects on myelination. Building upon our ongoing work demonstrating the beneficial influence of oestrogen on white matter integrity and neural function, the proposed thesis will explore how different sexual hormones contribute to resilience against age-related neural decline. By examining the interactions between hormonal status, brain connectivity, and behavioural performance, the project seeks to identify mechanisms through which hormonal regulation supports cognitive and neural health across ageing. Understanding these differential hormonal effects may provide important insights into sex-specific vulnerabilities and protective pathways in neurodegeneration and healthy ageing.



Methods and technology involved in the MRP: The study will combine advanced neuroimaging, electrophysiology, and behavioural approaches to characterise hormone-related changes in brain structure and function. Functional and macrostructural MRI will be used to assess large-scale brain connectivity, white matter organisation, and age-related alterations in neural networks, while electrophysiological recordings will provide complementary measures of neural activity and circuit function. Behavioural assays will evaluate cognitive and sensorimotor performance associated with healthy ageing trajectories. Together, these multimodal techniques will enable an integrative analysis of how sexual hormones influence myelin integrity, neural communication, and behavioural outcomes, providing a comprehensive framework for understanding hormonal neuroprotection in the ageing brain.

Contact: dsilvia@umh.es