

Group name: Development and assembly of bilateral neural circuits

IP name: Eloísa Herrera

Group web: <https://eloisahgm.wixsite.com/herreralab>

**Title of the MRP/TFM:**

Identification and mapping of brain circuits involved in the processing of pruriceptive information in pathological chronic itch.

**Summary of the Project:**

The sensation of itch, also known as pruritus, is perceived at the level of the skin. However, it is the nervous system the one in charge of detecting the itchy stimulus, transmit this information to the central nervous system and elaborate a motor response (scratching). This is only possible due to the presence of specialized sensory neurons which react to the contact of pruritogens (substances capable of inducing itch) in the skin and then transmit this information to specific spinal cord neuron subtypes. The processing of pruriceptive information takes place at the level of the spinal cord and gives rise to the commands that elicit a motor response capable of alleviating the itch: scratching the skin. Studies during the last decade have started to elucidate which are the neuron types involved in this process at the level of spinal cord but we still know very little about the next step in the pathway: which are the brain areas responsible for the perception of itch?.

Despite itch representing the most widespread dermatological problem worldwide, there is no effective treatment yet, let alone a cure for it. Our understanding of the neural circuits controlling itch information represent a major source of knowledge to effectively tackle this problem. We will use mouse models of chronic itch in order to identify and map the activation of neuronal ensembles in the brain specific to different types of chronic itch.

The specific objectives of this Master Research Project proposal are:

- Labelling of active brain neurons using the Fos-TRAP strategy.
- Processing of whole-brain samples for clarification.
- 3D imaging of transparent brain samples.
- Mapping of itch-active neurons to the brain atlas reference.

**Methods and technology involved in the MRP/TFM Project:**

Use of genetically modified mouse lines; Generation of clinically relevant mouse models of chronic pruritus; Tagging of stimulus-activated neuronal populations (TRAP); Whole-organ clarification in intact brain tissue; 3D imaging of transparent brain tissue. Computational analysis of 3D virtual brains.

**Member/s of the lab who will act as tutor/co-tutor of the project (if different from the group IP):** Dr. Augusto Escalante

**Contact:** [aescalante@umh.es](mailto:aescalante@umh.es)