

Group name: Development and assembly of bilateral neural circuits

IP name: Eloísa Herrera

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Title of the MRP/TFM:

Identification and characterization of retinal stem cells for their use in replacement therapies in neurodegenerative diseases of the retina.

Summary of the Project:

Retinal regeneration is one of the most common causes of visual dysfunction and blindness in the world. For example, some diseases that can cause it are glaucoma and retinitis pigmentosa. Currently, there is no therapy that prevents, slows down or restores vision in patients suffering from retinal degeneration, but cell therapy is considered the most promising strategy to restore sight in patients suffering from this problem. Regeneration of the mammalian retina is a subject of intense research as a potential treatment for degenerative retinal diseases. The eye has several properties that are advantageous as a suitable organ for regenerative approaches. At the periphery, the retina is flanked by a structure called the ciliary body (CB). Recent studies have proposed that the CB of the adult retina could serve as a source of retinal stem cells (rSC) and they could be appropriate for therapeutical use. Many aspects of the origin and biology of the CB are unknown and more recent experiments have challenged the capacity of CB cells to generate different types of retinal neurons. For that reason, we have isolated the CB of adult mice and we have performed single-cell RNA sequencing to further characterize the different populations in this zone (among them the one with stem capacity) and known the transcript program that has allowed them to maintain this stem capacity. The objective of this project is to further characterize the different populations of the CB through the candidates obtained after scRNA-seq analysis and identify which of them would have stem properties proposing it as a candidate population for therapeutical treatment.

Methods and technology involved in the MRP/TFM Project:

Immunofluorescence; In situ hybridization; PCR genotyping; Western Blot
Confocal microscopy

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

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