Proposal of Master Research Project / Trabajo fin de Master for the academic year 2022-23

Group name: Molecular neurogenetics
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Title of the MRP/TFM:

Mnb/Dyrk1A as a signaling integrator of neurogenesis. Implications for Down Syndrome and microcephaly .

Summary of the Project:

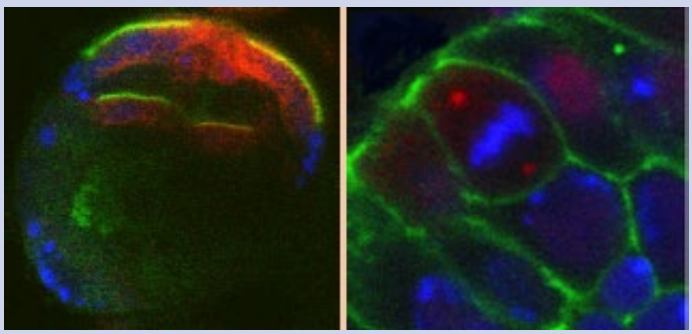
MNB/DYRK1A is a dosage sensitive gene located within a Down syndrome (DS) critical region of HsC21 and it is over-expressed in DS fetal brains. Remarkably, haploinsuffciciency of MNB/DYRK1A causes microcephaly and mental retardation. Previous work from our lab and others has shown that Mnb/Dyrk1A is a multiple regulator of CNS development processes including proliferation, neurogenesis, neuronal differentiation, cell death and synaptogenesis, all of which are related to DS neuropathologies. Hence, Mnb/Dyrk1A is presently considered a promising DS therapeutic target . Our work over the last 10 years using several experimental models support the idea that Mnb/Dyrk1A has the capacity to interact with several signaling pathways and key regulators of neural progenitors to coordinate complex cellular processes such as cell cycle, cytoskeleton and polarity/asymmetry, which are crucial for proper neurogenesis.

In this project we will use the Drosophila larval optic lobe, an excellent experimental model, to dissect the underlying molecular mechanisms of novel functions of Mnb/Dyrk1A in neurogenesis.

We expect that by revealing these novel molecular mechanisms and interactions, our results will contribute to generate new therapeutic strategies for DS

Methods and technology involved in the MRP/TFM Project:

Molecular Biology; Drosophila Genetics; Confocal and HR microscopy; Immunochemistry; Proteomics.



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

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