Encuentro de Investigación *Buscando sinergias*
Alicante | 7 de junio de 2022 Hospital General Universitario Dr. Balmis de Alicante. Salón de actos. De 10:00 h. a 13:30 h.

Asymmetric Division of Neural Stem Cells in Development and Tumorigenesis

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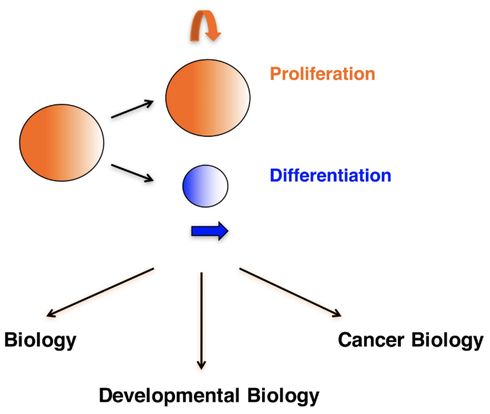
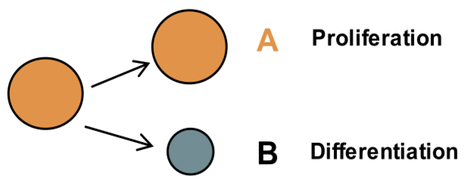
Abstract

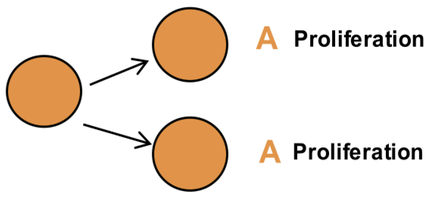
Asymmetric cell division is a universal and key mechanism to generate cell diversity during Development, and it is also an important process in Cancer and Stem Cell Biology. Our lab is currently focused on analyzing in depth this process both during development and in tumorigenesis. The aim of our research is to unveil the functional signaling networks underlying the autonomous and non-autonomous mechanisms that regulate asymmetric cell division combining Genetics, Cell Biology, Biochemistry, Molecular Biology and Proteomic techniques. Specifically, we are currently focused on two fundamental questions in the field: **1**.- Which are mechanisms that regulate the asymmetry of the division to finally render two different daughter cells? Our model system for answering this question are the embryonic and larval neuroblasts, the neural stem cells of the *Drosophila* central nervous system and **2**.- Which are the connections between failures in the process of asymmetric cell division and tumorigenesis? Our model systems to answer this question are the type II neuroblasts of the *Drosophila* larval brain and neurosphere cultures of human glioblastoma.



How are two different daughter cells generated?



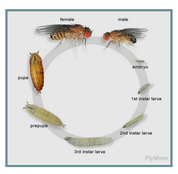
Connections between failures in asymmetric cell division and tumorigenesis

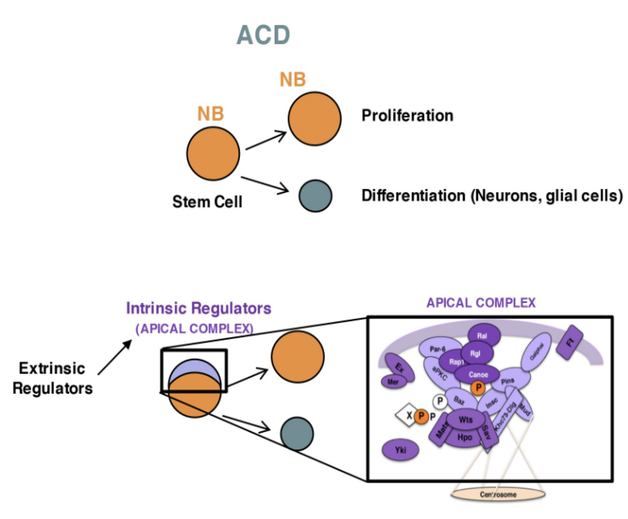


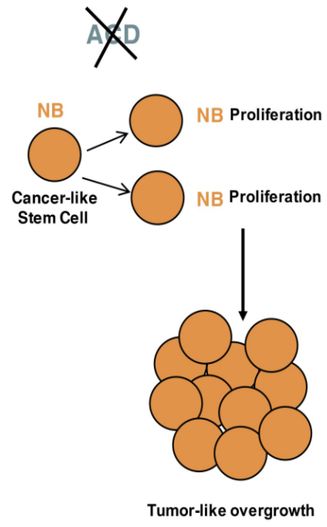
Neural stem cells of *Drosophila* CNS (Neuroblasts/NBs)

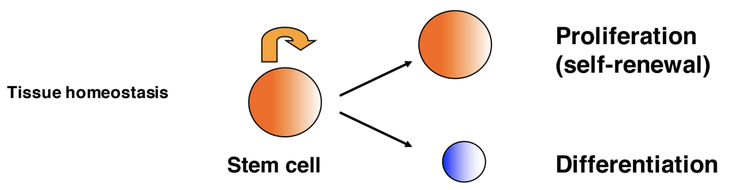
ASYMMETRIC CELL DIVISION: Stem cell proliferation / Cancer

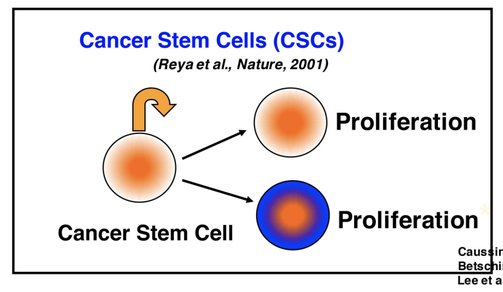
Drosophila











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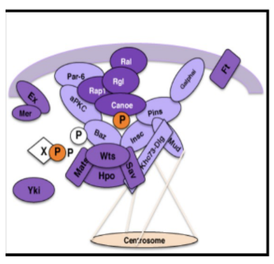
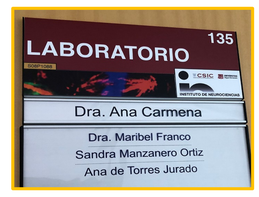
Betschinger et al., *Cell*, 2006
Lee et al., *Dev. Cell* 2006b



Relevance of failures in ACD and *Drosophila* ACD Regulators in Human Tumors/Cancer stem cells???

Glioblastoma (GBM): Glioma Stem Cells

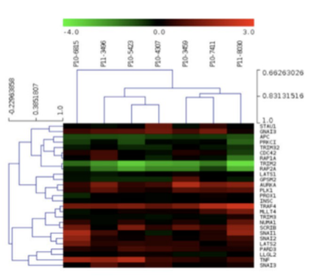
Collaborators: Dr. Miguel Saceda Sánchez, IBMC, FISABIO/UMH, Elche (Alicante)
Dr. Ricardo Gargini, Instituto de Salud Carlos III (Madrid)



Glioblastoma (GBM)

→ **In Silico Analysis (TGCA, etc)**

→ **GBM Arrays**



→ **GBM Neurosphere Cultures (established from GBM cell lines)**

- --Levels of gene expression (RT-PCR), protein levels & cellular localization
- --Functional assays: cause-and-effect relationships between levels and tumor properties
  - Stemness markers
  - Mode of cell division
  - Cell proliferation assays

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