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Centre de Recherche en Biologie Cellulaire de Montpellier



CRBM external seminar

Thursday May 11th 11:00 am Salle Marcel Dorée

Tuning Proliferation and Death in Development and Disease

Marisa MARTINEZ-MERINO

**Biochemistry Department
Univ Geneva
Switzerland**



Marisa has a background in chemical biology. She obtained her thesis in 2014 for her work in the laboratory of Eduardo Moreno first at CNIO in Madrid and then at ETH in Zurich. Since 2014 she is doing a post-doc in the laboratory of Marcos Gonzalez-Gaetan at the University of Geneva.

She is Drosophila expert with a strong background in genetics and quantitative developmental biology, focused on the mechanisms of Cell Death and tumor formation

Abstract

During development, morphogen gradients encode positional information to pattern morphological structures during organogenesis. Some gradients, like that of Dpp in the fly wing, remain proportional to the size of growing organs—that is, they scale. Gradient scaling keeps morphological patterns proportioned in organs of different sizes. In my recent work ([Merino et al, 2022 NCB](#) and [Merino et al, 2022 Trends in Cell Biology](#)) I found a mechanism of scaling that ensures that, when the gradient is smaller than the organ, cell death trims the developing tissue to match the size of the gradient. Scaling is controlled by molecular associations between Dally and Pentagone, known factors involved in scaling, and a key factor that mediates cell death, Flower. I also showed that Flower activity in gradient expansion is not dominated by cell death, but by the activity of Dally/Pentagone on scaling. I found a connection between scaling and cell death that may uncover a molecular toolbox hijacked by tumours.

Selected publications

Merino MM, Seum C, Dubois M, Gonzalez-Gaitan M. A role for Flower and cell death in controlling morphogen gradient scaling. *Nat Cell Biol.* 2022 Apr;24(4):424-433.

Merino MM, Rhiner C, Lopez-Gay JM, Buechel D, Hauert B, Moreno E. Elimination of unfit cells maintains tissue health and prolongs lifespan. *Cell.* 2015 Jan 29;160(3):461-76. doi: 10.1016/j.cell.2014.12.017.

Merino MM, Rhiner C, Portela M, Moreno E. "Fitness fingerprints" mediate physiological culling of unwanted neurons in *Drosophila*. *Curr Biol.* 2013 Jul 22;23(14):1300-9.