MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

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Institut de Biologia Molecular de Barcelona
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Instituto de Biología Molecular de Barcelona (IBMB)

Predoctoral position in developmental biology

➡ We are looking for a motivated PhD student with strong interest in basic research at the Institut de Biologia Molecular de Barcelona, CSIC-Parc Científic de Barcelona

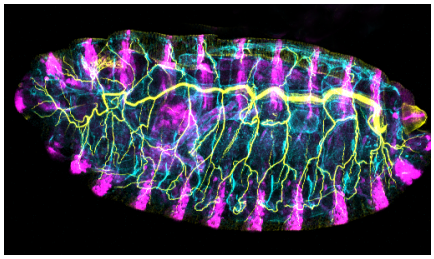
➡ Project description:

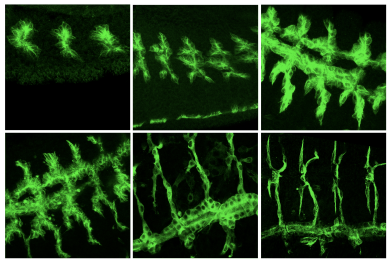
Intrinsic and extrinsic mechanisms underlying tubular organ morphogenesis

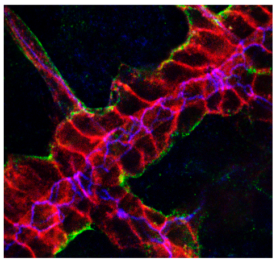
Many internal organs are organised as tubular structures, like lungs, kidneys, mammary glands or the vascular system. This type of structural organisation is critical for the function of these organs, which is the transport of gases, liquids or cells within the bodies. The formation (morphogenesis) of these organs during embryonic development involves an intricate, organised and complex combination of changes at the cellular level that ensure a physiologically functional mature organ.

Are you curious to understand how the cells form tubes?, how the organ spreads and grows? how the organ differentiates to perform its function? how the organ interacts with the environment to develop? how is the spatiotemporal pattern of morphogenesis genetically controlled? and which molecular mechanisms are at play?

These are the questions that we approach in the lab using the tracheal system of the fruitfly *Drosophila melanogaster*, which consists of a network of epithelial tubes that oxygenate the organism. As the mechanisms of morphogenesis of tubular organs have been highly conserved during evolution, tracheal development has become an ideal, amenable and tractable model system to investigate these issues. Current projects in the lab focus on interactions between the tracheal tubes and the surrounding tissues/environment (in particular extracellular matrices), analysis of cell adhesion and polarity and tissue differentiation.







Related literature from the lab:

- Moussian, B., Letizia , A., Martínez-Corrales, G., Rotstein, B., Casali, A., and Llimargas, M. (2015) Deciphering the genetic programme triggering timely and spatially-regulated chitin deposition. *PLoS Genetics.* 2015 Jan 24;11(1):e1004939.
- Olivares-Castiñeira I, Llimargas M. (2018) Anisotropic Crb accumulation, modulated by Src42A, is coupled to polarised epithelial tube growth in Drosophila. *PLoS Genet.* 2018 Nov 26;14(11):e1007824. doi: 10.1371/journal.pgen.1007824. eCollection 2018 Nov.
- Letizia, A., He, D., Astigarraga, S., Colombelli, J., Hatini, V., Llimargas, M. and Treisman, J.E. (2019). Sidekick Is a Key Component of Tricellular Adherens Junctions that Acts to Resolve Cell Rearrangements. *Developmental Cell* 50. 10.1016/j.devcel.2019.07.007
- Kluβmann-Fricke B-J; Martin-Bermudo MD* and Llimargas M*. (2022). The Basement Membrane controls size and integrity of the *Drosophila* tracheal tubes. (*Authors for correspondence) *Cell Reports,* 2022 Apr 26;39(4):110734. doi: 10.1016/j.celrep.2022.110734.
- De Giorgio E; Giannios P; Espinas ML and Llimargas M. (2022). Dissecting the roles of Expansion/Rebuf and the chitin synthase Krotzkopf Verkehrt in chitin deposition in *Drosophila*. PLoS Biol. 2023 Jan 23;21(1):e3001978. DOI: doi: 10.1371/journal.pbio.3001978
- Letizia A, Espinàs ML, Giannios P, Llimargas M. The TNFR Wengen regulates the FGF pathway by an unconventional mechanism. Nat Commun. 2023 Sep 21;14(1):5874. doi: 10.1038/s41467-023-41549-3.

➡ Candidates should hold a degree in Biology, Biochemistry, Biotechnology, Biomedicine or similar

➡ Applications and information should be addressed to:

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