

The Offer.

We offer a Postdoctoral position (24 months) in [Merino Lab](#) at the [University of Liverpool \(ISMIB\)](#). This position is funded by the **Springboard Award** from the **Academy of Medical Sciences**. The position start date is **September 2025**.

The Question.

Currently, morphogen gradient scaling is one of the hottest fields in developmental biology¹⁻⁶. Scaling is fundamental, explaining how the machinery that controls pattern formation in development (the morphogens) can adapt so that organs of different sizes show morphological structures which are proportioned: the **same developmental machinery** can build the leg of a mouse, an elephant or a tumour.

We have recently found a novel scaling mechanism: Death-mediated scaling. If the gradient is not properly scaled *i.e.* if the gradient is shorter than the tissue, then a death program is triggered^{2,3}. In this project we propose to understand the relevance of this mechanism during human tumorigenesis in collaboration with the [Clatterbridge Cancer Centre](#) and **Clinical Academics**.

Our Lab/Institute Culture.

I maintain an open-door policy and aim to lead by example. You will meet the PI at least once per week to discuss the new research avenues and brainstorming. You will have the opportunity to get valuable interactions from the **exciting multidisciplinary scientific environment** of the Institute of Systems, Molecular and Integrative Biology at the [University of Liverpool](#), as well as activities run by our Postdoc Society. In my work environment, I promoted equity and diversity at different academic levels, completing also my EDI training at the [University of Liverpool](#). As a Research Group Leader in the lab and in my teaching roles, I continue promoting and expanding these values that are very well aligned with those of our Institute and the [University of Liverpool](#).

How to apply?

If you are interested in this position, please send a motivation letter and your CV to the PI.

Email: marisa.merino@liverpool.ac.uk

Review of applications will start immediately.

References.

- (1) Hamaratoglu, F.; de Lachapelle, A. M.; Pyrowolakis, G.; Bergmann, S.; Affolter, M. Dpp signaling activity requires Pentagone to scale with tissue size in the growing *Drosophila* wing imaginal disc. *PLoS biology* **2011**, 9 (10), e1001182, Research Support, Non-U.S. Gov't. DOI: 10.1371/journal.pbio.1001182.
- (2) M, M. M.; Gonzalez-Gaitan, M. To fit or not to fit: death decisions from morphogen fields. *Trends Cell Biol* **2022**. DOI: 10.1016/j.tcb.2022.09.003.
- (3) Merino, M. M.; Seum, C.; Dubois, M.; Gonzalez-Gaitan, M. A role for Flower and cell death in controlling morphogen gradient scaling. *Nat Cell Biol* **2022**, 24 (4), 424-433. DOI: 10.1038/s41556-022-00858-3.
- (4) Sheida Hadji Rasouliha, G. A., Cindy Reinger, Shinya Matsuda. Shaping and interpretation of Dpp morphogen gradient by endocytic trafficking. *BioRxiv* **2024**.
- (5) Simon, N.; Safyan, A.; Pyrowolakis, G.; Matsuda, S. Dally is not essential for Dpp spreading or internalization but for Dpp stability by antagonizing Tkv-mediated Dpp internalization. *Elife* **2024**, 12. DOI: 10.7554/eLife.86663 From NLM Medline.
- (6) Stapornwongkul, K. S.; de Gennes, M.; Cocconi, L.; Salbreux, G.; Vincent, J. P. Patterning and growth control in vivo by an engineered GFP gradient. *Science* **2020**, 370 (6514), 321-327. DOI: 10.1126/science.abb8205.