MAX PERUTZ LABS VIENNA

Ellis lab

MSc rotation/thesis student

About the Ellis lab

The Ellis lab studies tissue morphogenesis and maintenance through the lens of cell competition in the developing mouse skin and intestine. We ask how these epithelial tissues are organized and how their growth is controlled employing tools from genetics, cell biology and quantitative biology. We use both mouse models and primary cell/organoid lines in our projects.

About the position / the research project

Currently we have two positions open in the lab in two different projects:

1. **Tissue mechanics in mouse skin development:** Using the developing mouse epidermis and primary mouse keratinocyte culture, this project investigates how cells losing the polarity protein Scribble switch from competitive losers to winners as the skin stratifies. We characterize cell death and proliferation dynamics, remodeling of basement membrane ECM and cell shape, integrin-mediated cell-ECM adhesion and traction forces to test whether tissue mechanics acts as a key fitness-sensing mechanism in scribble-based cell competition.
   Your work can include: culturing primary mouse keratinocytes, processing embryonic skin tissue, histology, immunofluorescence staining, image analysis, FACS, RNA-sequencing data analysis.

2. **Tackling aneuploidy: small versus large intestine**: In this project we use mouse small and large intestinal organoids to ask how epithelial cells respond to aneuploidy, and why this response appears to differ between intestinal compartments. Using a pharmacological approach to induce controlled chromosome mis-segregation, we characterize the proliferative, apoptotic, and cell-competitive responses that determine aneuploid cell fate in a tissue-specific manner.
   Your work can include: i) generating, culturing and genetically modifying mouse SI and LI organoids ii) quantifying cellular dynamics through IF imaging (followed by image analysis) iii) techniques like qPCR/FACS/western blot.

Candidates

We are seeking motivated Master's students to join our research team. The ideal candidate holds a Bachelor's degree in Molecular Biology, Cell Biology, Biotechnology, or a related field like Bioinformatics which could be useful to help us implement better image segmentation and analysis pipelines or RNAseq data processing.
Important to note: all projects in the lab require some degree of mouse handling so please be advised of this before you apply.
Experience in cell culture techniques (cells/organoids), fluorescence microscopy and image analysis is a plus. An interest in microscopy, quantitative image analysis and molecular biology techniques is expected. We look for a proactive mindset, curiosity about epithelial and developmental biology, and the ability to work both independently and collaboratively.

MAX PERUTZ LABS
Vienna BioCenter • Dr.-Bohr-Gasse 9 • 1030 Vienna
Tel: +43 1 4277 24001 • office@maxperutzlabs.ac.at
www.maxperutzlabs.ac.at

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The position begins with a 8-week rotation (unpaid), with the possibility to continue into the Master's thesis based on successful performance and mutual agreement (this will be paid for the entire duration, 500€ per month).

Application

How to apply?
Both positions are available from early September. Send your detailed **CV** along with a **short motivation letter** explaining your background and how you could contribute to our projects to stephanie.ellis@univie.ac.at **with the subject line "MSc thesis application"**. You can also write to this email with any further questions.

About the Max Perutz Labs

The Max Perutz Labs are a research institute established by the University of Vienna and the Medical University of Vienna to provide an environment for excellent, internationally recognized research and education in the field of Molecular Biology. Dedicated to a mechanistic understanding of fundamental biomedical processes, scientists at the Max Perutz Labs aim to link breakthroughs in basic research to advances in human health. The Max Perutz Labs are located at the Vienna BioCenter, one of Europe's hotspots for Life Sciences, and host around 40 research groups, involving approximately 450 scientists and staff from more than 50 nations.

www.maxperutzlabs.ac.at