EPFL

Master's Thesis Projects in Chemical Biology / Protein Degradation

The research will be carried out in the Kozicka lab (Laboratory of Proteostasis and Molecular Therapeutics) at the ISIC, EPFL (Lausanne, Switzerland), which offers an international and collaborative research environment. We study how cells control the fate of proteins: how proteins are folded, modified, transported, and degraded, and how these processes can be rewired in disease. We work at the interface of chemical biology, biochemistry, structural biology, and functional genomics, with a particular interest in how small molecules can be used to probe and manipulate protein homeostasis.

For further information, please visit the lab's webpage: https://www.epfl.ch/labs/lpmt/

Possible projects: Master's projects will be defined together based on the student's interests, background, and timing. Examples of possible projects include:

- *Following a small-molecule clue from proteomics to mechanism*: We have identified compounds that unexpectedly change the levels of specific groups of proteins in cancer cells. A student could validate one of these effects, compare responses across a panel of cell lines, and help determine whether the compound reveals a new proteostasis vulnerability.
- *Reconstituting a protein degradation interaction in vitro*: Many degradation pathways depend on transient interactions between a ubiquitin ligase and its target. A student could purify proteins from a candidate ligase–target pair and test whether they interact directly using biochemical or biophysical assays. This project is well suited for someone interested in protein biochemistry or structural biology.
- *Building fluorescent reporters to follow protein stability in cells*: Fluorescent reporter systems allow us to follow protein abundance in living cells and ask how drugs or genetic perturbations change protein fate. A student could build or validate a reporter system to test candidate pathways controlling protein stability.

Techniques you can learn: Depending on the project, students may gain experience with cell culture, drug treatments, Western blotting, cell-based assays, protein expression and purification, in vitro assays, CRISPR approaches.

Who can apply: We welcome applications from both EPFL students and external Master's students enrolled in a biology, chemistry, drug discovery, biochemistry, chemical biology, molecular biology, bioengineering, or other relevant degree programme. External students may be eligible for the ISIC Master Grant, which supports Master's thesis projects carried out by international students at ISIC and provides funding for six months.

Requirements: Prior experience with cell culture, protein biochemistry, or data analysis is helpful but not required. More important are curiosity, careful experimental work, enthusiasm for chemical biology, and a collaborative mindset. Excellent spoken and written English skills are required.

How to apply: Please apply directly by email to zuzanna.kozicka@epfl.ch using the subject line: "LPMT Project Application: [Your Name]". Your application will only be considered if you attach the following as a single PDF document:

- CV, including contact details of at least two referees and an academic transcript
- brief statement, max. one page, describing your research interests, any prior research experience, and your motivation for joining the lab

We look forward to receiving your application!

EPFL
KOZICKA LAB