Title: Proteomics data analysis of early embryonic development

Interested in data analysis, developmental biology, and proteomics?
Join our lab for a Master's project (>5 months) focused on understanding early embryo development through large-scale protein data.

- *The project focuses on data analysis; no wet-lab work*
- *A basic level of R programming is required*
- *No prior experience with proteomics is required*

Project Description
Early embryonic development involves rapid and coordinated changes that shape cell fate and tissue organization. While gene expression studies have provided important insights, proteins are the functional workhorses of the cell and ultimately determine cellular behavior.

In this project, you will analyze quantitative proteomics datasets from:

- Mouse embryos (in vivo)
- Gastruloids, three-dimensional stem cell-derived models that mimic key steps of early embryo development in vitro

The goal of the project is to extract biological insight from complex proteomics data and to understand how protein levels change during different developmental stages. By comparing data from mouse embryos and gastruloids, the project aims to study how closely in vitro models resemble in vivo development and to identify similarities and differences between these systems.

What you will do

- Follow an online summer school to learn the basics of proteomics data analysis
- Analyze and interpret quantitative proteomics datasets
- Compare protein expression across developmental stages
- Visualize and summarize large datasets
- Link protein changes to biological processes
- Perform functional annotation and pathway enrichment analysis
- Integrate proteomics data with existing transcriptomic or developmental data
- Work with bioinformatics tools (primarily **R**)

Workplace
The student will be embedded in the Laboratory of Experimental Urology and will work under the standard UMC CAO working conditions, including a 36-hour working week. The student is expected to actively participate in laboratory activities and present data and progress during weekly lab meetings.

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