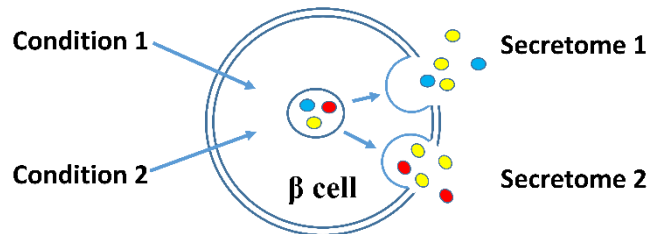




Master project: changes in beta cell secretome in response to varying folding conditions.

Pancreatic β -cells, residents of the islets of Langerhans, are the unique insulin-producers in the body. Their physiology is a topic of intensive studies aiming to understand the biology of insulin production and its role in diabetes pathology. However, investigations about these cells' subset of secreted proteins, the secretome, are surprisingly scarce and lists describing β -cell secretome upon varying endoplasmic reticulum folding conditions are not yet available.

We have identified new proteins (chaperones), localized to endoplasmic reticulum, which modulation primarily affects proinsulin folding, and wish to investigate whether their knock-out impacts β -cells secretome and has other, unrelated to proinsulin, consequences for diabetes pathology.



Is there a relationship between folding conditions and a profile of secreted proteins by beta cells?

THE PROJECT

During the project you will employ a set of newly generated cell lines with genetic alternations, induce them to secrete proteins, analyze the samples via mass spectrometry (under the supervision of associate professor Per Haaglund) and create lists of the respective secretomes. Identified proteins will be analyzed to categorize candidates functionally related to a given experiment condition (genetic) of the cell line used and further investigated using our lab protocols and/or via external collaborations.

Techniques you will learn during the project: mass spectrometry, cell transfection and transduction with Lentiviral particles, plasmid and primer design, PCR, protein analysis (reducing and non-reducing SDS-PAGE, Western blot, immunoprecipitation), ELISA, cell culture, literature search, critical analysis and presentation of the results.

THE GROUP

We are a small and dynamic research group at the Department of Biomedical Science (BMI, <https://bmi.ku.dk/english/research/proinsulin-folding/>). We are located at 12.6 in the old Panum building and we share office and lab spaces with 3-4 other groups. The project can be tailored to the interests of the candidate.

THE CANDIDATE

We are looking for a highly motivated candidate with an interest in cellular biology and/or diabetes. Ideally, the project is designed for a 10 months study. The project is suitable for a Master thesis for students of the study courses human biology, biomedical engineering, molecular biomedicine, biochemistry. If you wish to know more about this project, please contact associate professor Michal Marzec (michal@sund.ku.dk).