

# MSc-project

**Title:**

Unraveling the composition of key protein complexes associated with human diseases in multiple organs

**Description:**

Mutations in specific genes encoding potassium channels can give rise to diverse diseases, such as cardiac disorders, diabetes and cancer. It still remains elusive how mutations in one gene can present as a disease anchored in different organs in different people. Our hypothesis is that the key to solving this puzzle lies in investigating the protein complexes that the potassium channels are part of in the different organs. The reasoning for this is that proteins rarely operate as isolated entities in-vivo, but rather form complexes with other proteins. The proteins that interact with one another affect each other's function. This means that the functional phenotype of a mutated protein may depend on its protein interaction partners. In this project we therefore propose to delineate the molecular composition of the protein complexes formed with the particular potassium channels across cardiac, pancreatic and intestine tissues. The student shall apply state-of-the-art technology to investigate the protein complex compositions. In the master's project the student shall perform immunoprecipitations from tissue samples and primary cell cultures and analyze the isolated protein complexes by high-resolution mass spectrometry. If this is done successfully we shall integrate our proteomics data with large scale human genetic data, ultimately enabling us to identify new disease associated proteins.

Note: Earliest start date of the project is May 1<sup>st</sup> 2017.

**Required qualifications:**

Highly ambitious, self-driven and motivated students with flair for wet-lab work (attention to details) and an interest in bioinformatics.

**Contact information:**

Associate Professor Alicia Lundby.  
alicia.lundby@sund.ku.dk

Department of Biomedical Sciences and NNF Center for Protein Research