## Project proposals for students from **Immunoendocrinology** group.

http://bmi.ku.dk/english/research/immuno\_endocrinology/group\_members/



Under the supervision and leadership of Prof. Thomas Mandrup-Poulsen, Assistant Professor Michal Marzec and PhD student Tina Dahlby our group would like to present following projects that can be undertaken by the students from UCPH **during the fall of 2018.** 

- 1. The role of defective proinsulin folding and degradation in the development of type 2 diabetes. Within this project we aim to identify new proteins critical for the proper insulin biosynthesis.
- 2. How do proinsulin peptides become immunogenic in Type 1 diabetes? This projects aims at understanding the process leading to proinsulin becoming a major antigen responsible for initiation of autoimmunological disease, type 1 diabetes.
- **3.** The roles of CBP and EZH2 in HDAC3-mediated glucolipotoxicity in beta cell. We aim to describe the function of EZH2 and CBP as transcription factors and/or post-translational modifiers in the metabolically stressed β cell.
- 4. Inflammatory  $\beta$ -cell damage, iron, and the circadian clock molecular insights towards treating diabetes.

The overarching objective of this proposal is to elucidate the mechanism of interaction between inflammatory  $\beta$ -cell damage and the circadian clock in the development of diabetes.

Methods employed within the projects: protein expression analysis, protein knock-down (Lentiviral delivery of shRNA), protein knock-out (CRISPR/Cas9), co-immunprecipitation, generation and expression of tagged proteins, point mutagenesis, protein folding via pulse-chase and non-reducing SDS-PAGE, mass spectrometry, ChiP and reverse ChiP, qPCR, ELISA, cell death, flow cytometry, virus generation, mouse models: induction, collection, tissue separation, analysis; pancreatic islets isolation and secretory function analysis AND MANY MORE!!!



**Prof. Thomas Mandrup-Poulsen** pioneered the field of islet-cell failure and destruction in diabetes mediated by innate immune mechanisms by his discovery of the inhibitory and proapoptotic actions of inflammatory cytokines, for which he was awarded the 1994 Minkowski Prize of the EASD.

> 360 publications> 18500 citationsH-index: 70> 70 invited international lectures.