aBSc/MSc-project for students in Biomedical Engineering, DTU/KU

Title: **Identification of peptide ligands in drug delivery**

Description: The blood-brain barrier (BBB) is an anatomical and physiological barrier that hinders unwanted substances to enter the brain. However, this also makes drug delivery over the BBB difficult. Peptides could be one way to improve local delivery of drugs to the brain since they can bind to proteins specifically localized to blood vessels in the brain. A few peptide sequences have been identified as interesting for targeted BBB transport, including 10-20 residue sequences developed from melanotransferrin. However, the cellular target for this transport, and therefore the mechanism of transcytosis, is not known. Previous studies have suggested the low-density lipoprotein receptor-related protein as a target for the receptor-mediated transcytosis of melanotransferrin. Pull-down assays are *in vitro* assays that can be used as screening tools for identifying unknown protein targets, using the interaction between a ligand and protein.

The aims are:

- to set up a pull-down assay for the identification of cellular targets for transport across the BBB
- to identify the cellular targets for the peptides of interest

Required qualifications: Basic chemistry skills, biochemistry, preferentially skilled in tissue culture

Responsible institution: DTU Nanotech

Contact information:

Casper Hempel: cash@nanotech.dtu.dk

Sara Björk Sigardardóttir: sabsi@nanotech.dtu.dk

Allowed no of students per report: 1-2

DTU supervisor: Casper Hempel, Sara Björk Sigurdardóttir