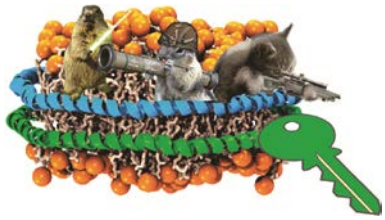
BSc/MSc-project

Title: Hijack biological nanoparticles to deliver anti-cancer and immunotherapeutic drugs to solid tumors



Description: High-density lipoprotein (HDL) is a nanoparticle that transports lipids in the circulatory system. Many types of cancers are hungry for HDL-lipids. Lipids/food that enable the tumor to expand and metastasize.

We ***hypothesize*** that synthetic HDL (sHDL) can be used to deliver lipid-like drugs to malignant tumors in a 'Trojan Horse' fashion. sHDL possess several attractive properties for drug delivery including:

- sHDL is a biological-like particle and therefore biodegradable and non-immunogenic
- sHDL is small and exhibits a long circulation time in blood - leading to a high accumulation in tumors
- sHDL features a natural ligand that mediates HDL-cargo uptake in several types of cancer cells

Primary tasks:

- Isolate the key protein apoA-I in HDL from human blood
- Synthesize sHDL particles
- Conduct biodistribution studies in tumor bearing mice using radioactive labeling and PET scanning

Obtained skills: Protein purification, nanoparticle formulation and characterization, pharmacology and cancer research including immunotherapy.

Required qualifications: Lab experience

Responsible institution: DTU Nanotech

Contact information: Associate Professor Jens Bæk Simonsen, DTU Nanotech, jbak@nanotech.dtu.dk

Allowed no of students per report: 1

DTU supervisor: Associate Professor Jens Bæk Simonsen, DTU Nanotech, jbak@nanotech.dtu.dk