

This bioinformatics-based project is suitable for research training or degree project for students studying on master-level. Start-date of project is flexible, but not prior to middle/end of October. Questions and/or application: sara.lundsten@igp.uu.se

Targeted tumor therapy with lipid based nanoparticles

- Help us find potential targets present on cancer cells

Many patients with cancer are treated with radiation therapy. The radiation can be combined with radiosensitizing drugs, which makes the cancer cells more sensitive to radiation. Current research in the Marika Nestor group at the department of Immunology, Genetics and Pathology (IGP) focuses on targeting tumor cells with radiosensitizing compounds loaded onto lipid bilayer disks (lipodisks). By attaching a targeting molecule, the particle actively binds to tumor cells and side effects of the drug can be avoided.

The current model system consists of radiosensitizing drugs that act on wildtype p53, a transcription factor which controls the cellular response to radiation exposure. The drug is loaded onto a lipid nanoparticle with a targeting molecule (Epidermal Growth Factor, EGF) conjugated to the surface. EGF binds to the EGF-receptor (EGFR) which is overexpressed in many cancers. It has been difficult to find cancer cell lines which have wildtype p53 together with overexpression of EGFR, something that might point to this not being a common trait in tumors. New possible targets, such as overexpressed receptors on tumor cell surfaces, that can be targeted therefore needs to be found.

The projects main focus will be to find new potential targets which is co-expressed with wildtype p53 and can be used for lipodisk targeting. Secondly, it would be interesting to investigate co-expression of wildtype p53 and EGFR in patient samples and cancer cell lines.