

Systems biology of dendritic cell vaccination against melanoma

Vaccination of melanoma subjects with dendritic cells that present melanoma antigens is an experimental cellular immunotherapy against cancer. Yet the systemic effects of such vaccination have never been measured. At the department of Medical BioSciences we have a large set of gene expression data (RNA seq) from blood from subjects (N=99) that have been obtained before and after vaccination with dendritic cells and control patients (N=50) injected with placebo. The goal of the project is to determine which genes and pathways are differentially regulated upon vaccination, and which of these pathways correlate with recurrence free survival of the subjects and/or with immunological parameters that have been measured. The project encompasses the analysis of the RNA seq data, from the quality control, mapping to genes, and determining read counts of the genes to the using of mixed effects models to disentangle the effect of the various covariates, including the immunological relevant ones, on gene expression. We are looking for a student with experience in working with R and/or an interest in immunology and the analysis of omics data. The specifics about working with RNA seq data can be learned during the project, as well as the statistical techniques. The bioinformatics project is 36 EC or possibly longer, depending on the interest of the student. Please contact Martijn Huijnen (martijn.huijnen@radboudumc.nl) for details.