Master thesis spring 2022 at Karolinska Institutet - ”Multi-omics Analyses of IBD”

The aetiology of colorectal diseases such as IBD (inflammatory bowel disease), diverticular disease, metaplasia/colorectal cancer and IBS (irritable bowel syndrome) needs further investigation. 1200 patients with various diagnoses underwent a colonoscopy at Danderyd’s hospital and provided a fecal and a serum sample. Each patient also completed a detailed dietary and lifestyle questionnaire.

The fecal samples were shotgun sequenced for taxonomic and functional analysis of the fecal microbiota. Serum samples were profiled using a proteomics inflammation panel as well as for bile acids and short-chain fatty acids (SCFA), important, health-promoting microbial metabolites. We recently also submitted serum samples to metabolomics analysis, and a leaky gut assay. Data delivery for these is expected during the fall of 2021.

We will focus on one diagnosis, i.e. IBD and compare patients to individuals without a diagnosis using both biostatistical tests and machine learning approaches for one or several datasets. The complexity of the project can easily be adjusted to the programming level of the student, however, knowledge in R and/or python are required.

The project will be performed at CTMR (Centre for Translational Microbiome Research), Biomedicum, KI Campus Solna under Assistant Professor Stefanie Prast-Nielsen. Depending on the Covid-19 situation, some of the work could be performed remotely.

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