



Two master thesis projects, spring 2023 at Karolinska Institutet - "Metagenomics Analyses of patients with colonic abnormalities"

Are you interested in the gut microbiota and its role in intestinal diseases? Do you want to work with machine learning algorithms and their validation as disease classifiers based on the gut microbiota? We now have two master thesis projects available at the Centre for Translational Microbiome Research at Karolinska Institutet.

Department: Department of Microbiology, Tumor and Cell Biology (MTC), KI

Place: KI campus, Solna

Start: By agreement

Application: stefanie.prast-nielsen@ki.se

The aetiology of colorectal abnormalities such as diverticular disease, polyps, and metaplasia/colorectal cancer needs further investigation. 1,200 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. In the serum, markers for "leaky gut" were measured. All data is ready for analysis.

We are looking for two motivated master students for the bioinformatics analyses, each focusing on one diagnosis, i.e., polyps or diverticulosis. The fecal microbiota will be analyzed in both the patient groups and a control group using machine learning approaches to build classifiers for the disease and to select important contributing features. If time allows, the association of these features to leaky gut markers will be analyzed as well.

For this project, basic bioinformatics knowledge and basic proficiency in R is needed.

The project will be performed at CTMR (Centre for Translational Microbiome Research), Biomedicum, KI Campus Solna under supervision of Research Specialist Stefanie Prast-Nielsen together with co-supervisor Gustav Ahlström, former master student (2022) from the Master's Programme in Molecular Biotechnology Engineering at Uppsala University.