

## **Masters Project in Bioinformatic Genome Analysis of *Campylobacter* Sources**

The institute: The IMM is part of the UZH and combines microbiology diagnostics with applied research.

The group: The Enriching Microbiology Research Group (<https://enrichingmicrobiology.net/>) focuses mainly on genomics of difficult-to-culture pathogens. Through target enrichment and custom analysis we get the best stories from our genomes.

The project: Investigation into *Campylobacter jejuni* infection sources: analysis of genome data from isolates collected over four years from multiple sources

Description: *Campylobacter jejuni* is a foodborne pathogen causing human diseases ranging from food poisoning to sepsis. *Campylobacter* is often caught, or assumed to be caught, from eating chicken and poultry. Most countries have a peak of cases in Summer, but German-speaking countries also have a peak in Winter. We wanted to find out why, and if Fondue Chinoise is responsible. Using whole genome sequencing, providing the highest level of discrimination between isolates, we have obtained data on isolates from patients, chicken meat and other sources. The project requires a careful bioinformatic analysis and comparison of over 600 genomes to infer infection sources, investigate virulence factors and determine antimicrobial resistance rates.

Requirements: Interest in microbial genomics bioinformatics; command line and HPC knowledge; prepared for predominantly computer based project. Specific bioinformatic methods will be researched / taught.

We offer: A friendly and ambitious group with firm projects and high likelihood of projects leading to publication. Cutting edge diagnostic, computations and genomes sequencing facilities. Enrollment on high quality training courses and conferences will be provided where relevant. The IMM has an active student population and access to multi-disciplinary seminars.

Please Note: There is no funding associated with this project. Ideally you will already be enrolled at the UZH (<https://www.uzh.ch/en/studies/programs/master.html>) or a local University / Fachhochschule. In terms of living costs, the university recommends that students have around 3000 CHF per month to live in Zurich.

Application: Please contact PD Dr Helena Seth-Smith ([hsethsmith@imm.uzh.ch](mailto:hsethsmith@imm.uzh.ch)) with your CV if interested.

## **Masters Project in Genome Data Analysis from Sequence-Captured Samples**

The institute: The IMM is part of the UZH and combines microbiology diagnostics with applied research.

The group: The Enriching Microbiology Research Group (<https://enrichingmicrobiology.net/>) focuses mainly on genomics of difficult-to-culture pathogens. Through target enrichment and custom analysis we get the best stories from our genomes.

The project: Analysing bacterial genome data from clinical samples: finding the best tools to analyse sequence capture data.

Description: Many bacteria cannot be grown easily in the laboratory, making their genomes hard to sequence. We are using sequence capture / target enrichment techniques to obtain genome data on panels of syndromically related bacteria, such as those causing sexually transmitted infections. We have great data covering complete genomes of target bacterial pathogens, but also with human and other bacterial contamination. In order to best disentangle the data, to be able to analyse each species as well as possible, we want to find the best tools. This project will use existing sequence data to analyse in multiple ways to find the best analytical tools.

Requirements: Interest in microbial genomics bioinformatics; command line and HPC knowledge; prepared for predominantly computer based project. Specific bioinformatic methods will be researched / taught.

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