

Master thesis project in an internationally unique migraine study using systems genetics approaches

The molecular genetics group at the Danish Headache Center, Rigshospitalet-Glostrup (mgDHC) is offering a unique master's thesis projects in the analysis of RNA-Sequencing data of migraine patients.

Background:

Migraine is a heritable neurovascular headache disorder with recurrent headaches and it affects almost 20% of the population. The migraines are moderate to severe headache lasting 4 to 72 hours. Migraine patients are divided into two groups depending on whether the attack is associated with an aura, i.e. perceptual disturbances e.g. visual disturbance that is occurring prior to a migraine attack. The pathology of migraine is not completely understood, however 38 loci have been associated with increased risk of migraine. Only a small part of the migraine heritability is explained by these findings.

The migraine bus project:

We have an internationally unique cohort of 30 migraineurs that have been followed in- and outside of migraine attack. We collected blood samples at four time points that have been RNA-Sequenced and metabolomic profiling is as we speak performed at SSI. We furthermore have both genotype data and whole genome sequencing data on all migraineurs. We have a control sample of 20 healthy individuals, which are also RNA-Sequenced, whole genome sequenced, genotyped and metabolomic profiling is being performed. We want to discover genes, metabolites and pathways involved in migraine using several approaches, e.g.:

- Differential expression analysis
- Alternative splicing events
- Allele-specific eQTLs
- Differential network analysis
- Integration of genomics – metabolomics – transcriptomics

Qualifications:

You have a bioinformatics or life science background with flair for data analysis and scripting. You have experience with R and UNIX/Linux environment. Ideally, you also have experience with Python/ Perl or other scripting language but it is not a requirement. You are ambitious, positive, a team player and enjoy taking initiative with a high degree of commitment. Project length is 3 - 12 months (15 – 60 ECTS). If you are interested, please send a brief letter of motivation, resume and print of grades using the contact information below.

The project will be part of an ongoing project in the molecular genetics group at mgDHC (rigshospitalet Glostrup) and will therefore be carried out in close collaboration and under supervision of Lisette Kogelman, lead bioinformatics scientist.

Main supervisor: Thomas Folkmann Hansen, Research leader

Direct supervisor: Lisette Kogelman, Lead bioinformatics scientist

Project start: ASAP

Project duration: ½ - 1 year

Contact info: Lisette Kogelman, E-mail: lisette.kogelman@regionh.dk