

Practice module, Bachelor or Master topic „Analysis of Nanopore sequencing data”

Background:

In 3rd generation sequencing, namely long read sequencing, generates data consisting of sequence length between Kilo- and Mega-base-pairs range. In comparison to previous sequencing technologies, such long reads enabled us to overcome several structural obstacles during Genome analysis. One of such 3rd generation sequencing, Oxford Nanopore Technology (ONT) sequencing platform, was being established in FGK. In addition to the plain sequence information, ONT could also be used for direct modification detection. In the research group “epigenetics”, we are trying to utilize this capability for DNA methylation (Methylome) analysis. Wet-lab steps have been set up with the high-throughput GridION device, and several data sets have been generated. We are now working on finishing the *in silico* steps of workflow, as well as optimizing them for direct DNA methylation detection. This workflow will be based on Linux environment. Both ONT proprietary and open source third party tools will be taken into our workflow for evaluation. In this Practice module, Bachelor or Master topic, evaluations and optimizations of different tools for Nanopore sequencing data analyses are planned, in order to complete the workflow for direct DNA methylation detection.

Work Packages:

- evaluation and optimization of workflow for Nanopore sequencing data analysis
- data management (synchronization and exchange) between Linux and Windows environment
- test and implementation of new analysis modules, i.e. for DNA methylation analysis
- discussion and collaboration with group members about wet-lab verification of Nanopore results



We are looking for a highly motivated student with strong interest in Bioinformatics and Sequence analysis. Join a research project in an interdisciplinary, innovative research area and an open and friendly working environment.

The **workplace** is located at the Erfurt Research Centre for Horticultural Crops (FGK), University of Applied Sciences Erfurt, Kühnhäuser Straße 101, 99090 Erfurt.

The thesis can be prepared in **English** or **German** language.

If you are interested, then please contact Dr. Stefan Ehrentraut by email (stefan.ehrentraut@fh-erfurt.de) or by phone (0361 6700 3463). Further information is available at <https://www.fh-erfurt.de/forschungsstelle-fuer-gartenbauliche-kulturpflanzen-fgk>.