MOLECULAR SCIENCES
biochemie
chemie
pharmazie

Research Internship

GOETHE
UNIVERSITÄT
FRANKFURT AM MAIN

Denoising of tubulin structures with CARE

Motivation

Super-resolution microscopy enables the investigation of biological samples in the nanodimension. The method is limited by the optics of the microscope. the properties of the fluorophores, and the maximum light exposure tolerated by the sample. These limits translate in tradeoffs between imaging speed, spatial resolution, and light exposure that have to be chosen while imaging biological probes. With powerful denoising tools based on deep learning the possible parameter space of the measurements can be broadened.

Task Description

- Get familiar with CARE denoising with exemplarily dataset

- Create own dataset by recording tubulin structures under various conditions

- Apply CARE, report on hyper parameter tuning, dataset requirements, overall usability of framework, ...

- Programming skills are not required for this internship, you will be familiarized with basic Python functionalities
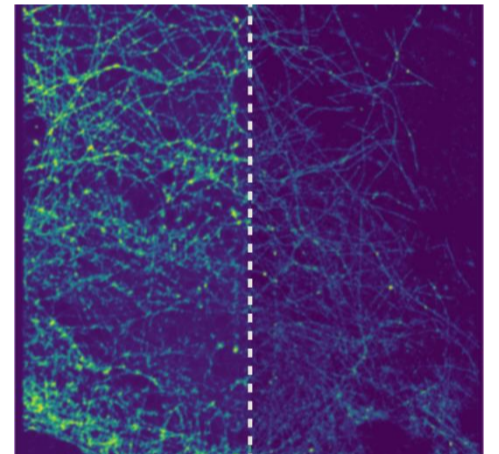
Key References

1. Weigert et al. (2018) Nat Meth, DOI: 10.1038/s41592-018-0216-7
2. von Chamier et al. (2020) Nat Comm, DOI: 10.1101/2020.03.20.000133
3. Nieves et al. (2018) Genes, DOI: 10.3390/genes9120621

Work Area

Laboratory	■	■	□	□	□
Microscopy	■	■	□	□	□
Data Analysis	■	■	■	■	■
Programming	■	■	□	□	□

Time

Possible Start

March 2021

Duration

4 weeks

Contact

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Language

Single Molecule Biophysics