

MSc Project in Structural Biology

We are inviting applications for a MSc project to be conducted at the Institute of Biological Information Processing (IBI-7: Structural Biochemistry), Forschungszentrum Jülich, in collaboration with Aachen University of Applied Sciences.

Background

Current evidence indicates that many proteins display transitions in structure and/or dynamics around the body temperature of the respective organism. Although these switching processes are very likely to be of physiological significance, the details as well as the underlying mechanisms are still poorly understood.

Project details

This project aims at an in-depth characterisation of such a transition *via* NMR spectroscopy, using myoglobin as a model system. NMR spectroscopy is uniquely suited for this purpose since it allows for monitoring the environment of specific nuclei within macromolecules in solution, uncovering alterations of both mean coordinates and conformational dynamics with very high sensitivity. The IBI-7 maintains a range of very powerful NMR instruments (jointly operated with the HHU Düsseldorf) on the Jülich campus.

For acquisition of multi-dimensional NMR spectra, isotope labelling of the protein is a prerequisite. The first working package of the project will therefore comprise recombinant expression and purification of ¹⁵N-labelled myoglobin according to published protocols. In a second step, this material is to be used in a temperature series of 2D NMR experiments, in order to (1) identify potential transitions and (2) assign them to specific amino acid residues.

In addition to the NMR-centred experiments outlined above, we are also applying X-ray crystallography to investigate temperature-dependent structural transitions in both myoglobin and hemoglobin. To the extent time and resources permit, the candidate is welcome to participate in these efforts as well.

Our offer

The IBI-7 features a highly interdisciplinary and diverse research environment with excellent instrumentation and project supervision. Remuneration (covering expenses) is available.

Our expectations

First and foremost, we expect the applicant to be enthusiastic about working with proteins in the wet lab. Good prior knowledge of and experience with basic methods of molecular biology and protein biochemistry are required, a good physics background is considered highly advantageous.

Please direct your application *via* e-mail to
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