

Ph.D. position in protein NMR spectroscopy

Title

Molecular mechanisms of intrinsically disordered scaffold proteins in cell signalling

Project description

In the context of the Impulscience project "ComplexScaffold" funded by the Bettencourt Schueller foundation, this thesis focuses on understanding the role of intrinsically disordered scaffold proteins in cell signalling. The goal of the project is to study how two disordered scaffold proteins within the JNK signalling pathway control signalling specificity. The scaffold proteins will be characterized at atomic resolution using nuclear magnetic resonance (NMR) spectroscopy and their interactions with GTPases, kinases and phosphatases of the JNK pathway will be studied. The role of liquid-liquid phase separation in activation of kinases will also be explored. Determining the molecular mechanisms that control signalling specificity is particularly pertinent as deregulation of many signalling pathways is associated with human diseases such as cancer. Thus, the thesis will open new horizons for drug discovery programs targeting the recruitment of GTPases, kinases and phosphatases by scaffold proteins.

Activities

- Expression and purification of proteins for biophysical and structural studies
- Characterization of disordered regions of scaffold proteins and their interactions with kinases and phosphatases
- Biophysical measurements of protein-protein interactions (ITC, SPR or MST)
- Structure determination of kinases in complex with scaffold proteins by NMR or X-ray crystallography

Starting date and application deadline

The thesis will start on the 1st of October 2023. Application deadline 1st of July 2023.

Background of the candidate

The ideal candidate holds a master degree in chemistry, biochemistry or structural biology (or related discipline) and has experience in protein expression and purification. Experience in solution NMR spectroscopy (acquisition and/or data analysis) would be an advantage. He/she should be able to work in a team and must be fluent in English (reading, speaking and writing).

Application process

Interested candidates should submit their CV, motivation letter outlining research interests and experience, copies of academic transcripts and degrees, and contact information of professional references to malene.jensen@ibs.fr.

Facilities

The candidate will join the team of Dr. Malene R. Jensen at the Institute of Structural Biology (IBS) in Grenoble. We are interested in elucidating the role of protein intrinsic disorder in cell signaling and in the development of methods for studying highly dynamic protein-protein complexes. The website of the team can be consulted here: www.jensen-nmr.fr

The IBS houses six high-field NMR spectrometers (3 x 600, 700, 850 and 950 MHz) and biochemistry facilities for cloning, expression and purification of proteins. Access is facilitated to a number of state-of-the-art research platforms through Integrated Structural Biology Grenoble (ISBG) (<http://www.isbg.fr/spip.php?lang=en>).