PhD Position in Structure Biology

Kemiska institutionen

Apply before 2020-12-10
• Temporary position longer than 6 months
• 100%
• Umeå

Description
A doctoral position in structural biology: development of drugs to block bacterial virulence factors is available in Professor Elisabeth Sauer-Eriksson's laboratory at the Department of Chemistry, Umeå University. The goal of the project is to increase our understanding of bacterial virulence, i.e. how bacteria infect a host cell. The project is carried out in a multidisciplinary environment based on established collaborations with Professor Jörgen Johansson and Fredrik Almqvist at Umeå University, Professor José Vazquez-Boland at Edinburgh University and Professor Birgitte Kallipolitis at the University of Southern Denmark. The doctoral student will be trained in structural biology, protein production from different types of organisms, as well as biochemistry and biophysics. Our research focuses on a transcription factor in listeria, called PrfA, which acts as the main regulator of virulence gene expression and plays a central role in the conversion of listeria from a harmless saprophyte to a human pathogenic bacterium. We have previously identified a specific class of molecules, so-called 2-pyridones that can reduce the pathogenicity of listeria. The purpose of the doctoral student's project is to i) develop these substances further towards functional drugs, and ii) study how various factors in the natural cellular environment control the PrfA regulation, in order to increase our understanding of the molecular mechanisms underlying virulence activation. The education in structural biology is mainly based on X-ray crystallography but can go in the direction of "single particle cryo EM" depending on the development of the project.

Working tasks
The aim of the project is to describe factors that govern the PrfA regulation in listeria and to develop inhibitors of PrfA through drug design based on structural studies. The expected tasks are summarized below:

• Purification of PrfA from listeria according to established protocol. Cloning, expression and purification of PrfA-like transcription factors from other bacteria.
• Structural studies on PrfA from listeria in various biologically relevant conditions or in complexes with designed inhibitors.
• Structural biological analysis of native and inhibited PrfA from other pathogenic bacteria.
• Biochemical and biophysical analysis of protein and protein complexes with, for example, light spectroscopy and calorimetric methods.
• Writing of scientific articles.
Qualifications
To be admitted for studies at third-cycle level you are required to have completed a secondcycle level degree, or completed course requirements of at least 240 ECTS credits, of which at least 60 ECTS credits are at second-cycle level or have an equivalent education from abroad, or equivalent qualifications.

To fulfil the specific entry requirements to be admitted for studies at third-cycle level in chemistry, you are required to have completed first-cycle courses of at least 90 ECTS credits within the field of chemistry or another subject considered to be directly relevant to the specialization in question. Of those 90 ECTS credits, at least 15 ECTS credits shall have been acquired at second-cycle level within the specialization or an equivalent subject.

Good knowledge in English, both written and spoken, is a requirement. You must be strongly self-motivated and have the ability to work in a multidisciplinary work environment.

Terms of employment
The appointment aims at a PhD degree and the main task of the PhD student is to pursue their doctoral studies, which includes participation in research projects as well as postgraduate courses. In the assignments, teaching and other departmental work (up to a maximum of 20%) can be included. The employment is limited to four years full-time or up to five years when part-time teaching. The salary is fixed according to the local agreement for PhD students.

Application
A complete application should contain the following documents:

- A cover letter including a description of your research interests and motivation for applying
- A Curriculum Vitae
- Certified copies of degree certificates or equivalent, including documentation of completed academic courses and obtained grades and other relevant certificates
- Name and contact information of at least two reference persons

Applications must be submitted via our e-recruitment system no later than December 10, 2020.

For more information please contact Professor Elisabeth Sauer-Eriksson, telephone number: +4690-786 7623, e-mail: Elisabeth.sauer-eriksson@umu.se

About us
Umeå University has a vibrant environment in “Integrated Structural Biology” that harbors 19 research groups with totally around 90 active people. We have state of the art equipment for cryo EM, x-ray crystallography, NMR spectroscopy and high performance computation. Please visit www.biostruct.umu.se for more information. The Department of Chemistry is one of the largest departments within the Faculty of Science and Technology with a staff of approximately 200 of which approximately 40 are doctoral students, and a strong expanding research. The Department has three major research areas: Biological Chemistry, Environmental and Biogeochemistry, and Technical Chemistry. We are also a strong partner in the KBC, Chemical-Biological Center. Information about the postgraduate education can be found on the Faculty of Science and Technology website: www.umu.se/en/faculty-of-

**Admission**

By agreement

**Contact**

Elisabeth Sauer-Eriksson

090-786 76 23

**Registration number**

AN 2.2.1-1575-20

**Salary**

Monthly

**Union representative**

SACO

090-786 53 65

SEKO

090-786 52 96

ST

090-786 54 31

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*Umeå University wants to offer an equal environment where open dialogue between people with different backgrounds and perspectives lay the foundation for learning, creativity and development. We welcome people with different backgrounds and experiences to apply for the current employment. We kindly decline offers of recruitment and advertising help.*