PhD in Microbial Chemistry with focus on biochemistry of cyanobacterial carbon fixation

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Uppsala University is a comprehensive research-intensive university with a strong international standing. Our ultimate goal is to conduct education and research of the highest quality and relevance to make a long-term difference in society. Our most important assets are all the individuals whose curiosity and dedication make Uppsala University one of Sweden’s most exciting workplaces. Uppsala University has over 45,000 students, more than 7,000 employees and a turnover of around SEK 7 billion.

The Department of Chemistry - Ångström conducts research and education in the chemistry field. The department has more than 250 employees and has a turnover of 250 million SEK. At the department's six programs, we conduct very successful research of a high international standard. We have a large number of externally funded research projects, often with international cooperation and we see continued good growth in our subject area. The department has education assignments in engineering programs and master's programs. More information is available on our website.

The Microbial Chemistry research program currently consists of four principal investigators and we now have an open PhD position within Cecilia Blikstad’s group. Research within Microbial Chemistry is focused on cyanobacteria, photosynthetic microorganisms with the ability to convert solar energy, CO2 and water into useful compounds. The greater goal with our research is to address global warming and food shortage by converting atmospheric CO2 into valuable products such as biofuel, specialized chemicals and food. We have a highly creative research environment, and our projects provide many opportunities for interaction and collaboration within the department as well as with outside collaborators.
**Project description:** Rubisco, the primary CO2-fixing enzyme of the Calvin-Benson-Bassham cycle, is the most abundant protein on Earth. Despite this centrality, Rubisco is a relatively slow enzyme and fails to distinguish between CO2 and the competing off-target substrate of O2. To overcome these limitations bacteria, algae and plants have evolved different types of CO2 concentration mechanisms. These systems create a locally high concentration of CO2 around Rubisco and thereby increase overall CO2 fixation rates. The cyanobacterial CCM consist of two major components: inorganic carbon transporters that actively accumulate bicarbonate in the cytosol and a protein organelle called the carboxysome.

Carboxysomes co-encapsulate the key enzymes for CO2 fixation, Rubisco and carbonic anhydrase, within a protein shell. These complex protein structures are built out of more than 10,000 distinct protein pieces that spontaneously self-assemble within the bacteria cell. We use a combination of biochemistry, enzymology, molecular biology, synthetic biology, structural biology, and bioinformatics to study various aspects (function, structure, assembly, regulation etc.) of the cyanobacterial CO2 concentrating mechanism. You will work in a project focusing on protein interactions, regulation, and activity of the carboxysome and its encapsulated enzymes. The acquired knowledge will lead the way for downstream applications aiming at enhancing photosynthetic efficiencies in future microorganisms and crops. For more information visit the lab website (blikstadlab.org).

**Work duties:** The main duties of doctoral students are to devote themselves to their research studies which includes participating in research projects mentioned above and third cycle courses. The work duties can also include teaching and other departmental duties (no more than 20%).

**Eligibility requirements:** A person meets the general admission requirements for third-cycle courses and study programmes if he or she:

- has been awarded a second-cycle qualification, or
- has satisfied the requirements for courses comprising at least 240 credits of which at least 60 credits were awarded in the second cycle, or
- has acquired essentially equivalent knowledge in some other way in Sweden or abroad.
**Required qualifications:**

- Degree or equivalent as above in biochemistry, molecular biology, biophysics, biotechnology or similar.
- Very good oral and written proficiency in English.

Large emphasis will be put on personal qualities. Consideration will be given to good collaborative skills, good analytical skills, drive and independence, and how the applicant’s experience and skills complement and strengthen ongoing research within the department, and how they stand to contribute to its future development.

**Desirable qualifications:**

- Practical skills in biochemistry and/or molecular biology or similar is highly beneficial.
- Previous experience in protein biochemistry including but not limited to protein purification, protein-protein interactions, enzymology or structural biology is beneficial.
- Previous experience in molecular biology including but not limited to molecular cloning or working with photosynthetic microorganisms is beneficial.

**Terms of employment:** The rules about PhD students are found in the Higher Education Ordinance Chapter 5 §§1-7 and the [university's rules and guidelines](#).

**Application procedure:** The application should include a personal letter describing yourself, your research interest and why you are interested in the position, a CV, certificates of degrees and grades, a copy of Master thesis, published article or other relevant materials, if available. Also include contact information of at least two references.

**Pay:** According to local agreement (Local collective agreement for doctoral students and students).

**Starting:** September 1, 2021 or as otherwise agreed.

**Type of employment contract:** Fixed-term (100 %) for four years, according to the Higher Education Ordinance chapter 5 § 7.
For further information about the position, please contact: Cecilia Blikstad, cecilia.blikstad@kemi.uu.se

You are welcome to submit your application no later than June 30, 2021, UFV-PA 2021/2330.

Are you considering moving to Sweden to work at Uppsala University? If so, you will find a lot of information about working and living in Sweden at www.uu.se/joinus. You are also welcome to contact International Faculty and Staff Services at ifss@uadm.uu.se.

Please do not send offers of recruitment or advertising services.

Submit your application through Uppsala University's recruitment system.

Placement: Department of Chemistry - Ångström Laboratory
Type of employment: Full time , Temporary position longer than 6 months
Pay: Fixed salary
Number of positions: 1
Working hours: 100 %
Town: Uppsala
County: Uppsala län
Country: Sweden
Union representative: Seko Universitetsklubben seko@uadm.uu.se
ST/TCO tco@fackorg.uu.se
Saco-rådet saco@uadm.uu.se
Number of reference: UFV-PA 2021/2330
Last application date: 2021-06-30

Login and apply