UNIVERSITETET I OSLO

Jobbnorge ID: 275662
Deadline: 3/19/2025
Website: http://www.uio.no/
Scope: Fulltime
Duration: Engagement

PhD Research Fellow in Soft Matter and (Bio)Physical Chemistry

About the position

Position as PhD Research Fellow in Controlling Molecular Transport and Cargo Delivery across Lipid Membranes available at the Department of Chemistry.

No one can be appointed for more than one PhD Research Fellowship period at the University of Oslo.

The fellowship period is 3 years.

A fourth year may be considered with a workload of 25 % that may consist of teaching, supervision duties, and/or research assistance. This is dependent upon the qualification of the applicant and the current needs of the department.

Job description

This is a PhD-project within the CLIMB project (ID 101169269), funded under the Marie Skłodowska-Curie Actions Doctoral Network (MSCA-DN). CLIMB is a highly interdisciplinary Doctoral Network designed to advance our understanding of lipid membrane complexity and its potential for applications in biotechnology, healthcare, and sustainability. CLIMB brings together leading research laboratories with expertise spanning chemistry, physics, biology, and computational sciences. The CLIMB project focuses on studying the complex interplay between lipid composition, structural properties, and membrane-driven interactions, with the aim of developing advanced lipid-based materials for a variety of applications. Key research themes include:

- Understanding the role of lipid compositional complexity in membrane properties and functions.
- Developing lipid nanomaterials for use in mRNA delivery systems, bio-sensors, and sustainable formulations.
- Physicochemical characterization of aggregates formed by novel lipid mixtures, including natural extracts and polymer/peptoid coatings.

Doctoral Candidates will benefit from a rich, multidisciplinary training environment, with opportunities to collaborate with both small and large industrial partners, contributing to cutting-edge research with real-world applications. Selected candidates will engage in multidisciplinary research, participate in international secondments across academic and industrial settings, and contribute to high-impact publications and conferences.

PhD-project in Oslo

Antimicrobial resistance (AMR), dubbed the "silent pandemic," is a leading global challenge of the 21st century. Antimicrobial peptides (AMPs), or host defence peptides, are found in nearly all species and serve as a defence against pathogens. Notably, these natural antibiotics have coexisted with bacteria throughout evolution without causing significant resistance. Their effectiveness is generally attributed to their ability to disrupt bacterial lipid membranes, leading to leakage, rapid depolarization, and consequently, bacterial death. However, the molecular details of their membrane interactions remain poorly understood, and questions persist about the nature of the "pores" they form and their capacity to penetrate membranes to target intracellular sites.
As part of the MSCA EU project, CLIMB, this PhD project aims to explore how antimicrobial peptides (AMPs) interact with model membranes. The research will primarily utilize X-ray and neutron scattering methods, complemented by computational modelling. The objective is to examine structural changes in the membrane and shed light on AMP-induced dynamic processes, such as the transport of salt, lipids, and therapeutic cargo across bilayers and individual cells.

The PhD candidate will undertake the design and preparation of model systems, such as lipid-based vesicles and nanoparticles. She/he will perform scattering experiments at major facilities and in home X-ray/light scattering labs, in addition to contributing to simulations and quantitative data modelling. Collaboration with other PhD students and principal investigators within the network, employing complementary techniques like imaging, will also be important. A high degree of self-motivation and the ability to independently manage and troubleshoot tasks are crucial. The candidate should also be eager to acquire new skills necessary to achieve the project's goals.

More about the CLIMB Project
Lipids are fundamental components of cell membranes. They form bilayers that regulate cellular interactions and transport. Their ability to self-assemble into complex, functional forms make them ideal for developing nanomaterials that mimic cellular membranes for advanced applications such as targeted drug delivery and biosensing. With the support of the Marie Skłodowska-Curie Actions programme, the CLIMB project aims to explore how the complexity of lipid compositions affects membrane structures, interactions, and emerging collective properties. The project connects leading research labs that will develop and characterise novel lipid mixtures for applications in mRNA delivery, biosensors, and eco-friendly formulations. Furthermore, they will provide new information on fundamental properties of complex lipid self-assembled systems.

For more detailed information, please visit:

https://cordis.europa.eu/project/id/101169269

Qualifications

The Faculty of Mathematics and Natural Sciences has a strategic ambition to be among Europe's leading communities for research, education and innovation. Candidates for these fellowships will be selected in accordance with this and expected to be in the upper segment of their class with respect to academic credentials.

- Applicants must hold a master's degree or equivalent in Chemistry, Physics, Physical Chemistry, Biochemistry or similar fields. A master's degree (120 ECTS) or an equivalent qualification with minimum grade B (ECTS grading scale) or equivalent. The master's degree must include a thesis of at least 30 ECTS.
- Foreign completed degree (M.Sc.-level) corresponding to a minimum of four years in the Norwegian educational system.
- Excellent fluent oral and written communication skills in English are required.
- The ability to work independently as well as in a cross-disciplinary team is required.

Desired qualifications:

- A strong background within topics related to (bio)molecular self-assembly, peptide sciences, soft matter or other related topics in biophysics/biochemistry/physical chemistry is desired.
- Experience in X-ray/neutron scattering techniques and associated data modelling is an advantage.
- Experience in spectroscopic methods for biophysical assays is an advantage.
- Previous experience in programming (C++, Python) is an advantage.
- Demonstrated interest in theory (thermodynamics, statistical mechanics etc.) and skills in programming and computational work is an advantage.

Marie Skłodowska-Curie requirements:

To be considered eligible for review, applicants must fulfil the following MSCA eligibility criteria:

- **Mobility requirement:** The applicant must not have resided or carried out their main activity in Norway for more than 12 months in the 3 years im-mediately prior to their recruitment date. Compulsory national service, short stays such as holidays and time spent as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.
- The applicants must be able to carry out full time research during the fellowship period; Requests for part-time may only be accepted for re-searchers' personal or family reasons and in agreement with the supervisor and beneficiary (UiO's) and with the prior approval by the granting authority.

Grade requirements:
The norm is as follows:

- the average grade point for courses included in the bachelor's degree must be C or better in the Norwegian educational system
- the average grade point for courses included in the master's degree must be B or better in the Norwegian educational system
- the master's thesis must have the grade B or better in the Norwegian educational system

Language requirements:

- Fluent oral and written communication skills in English. If eligible for a fourth year with teaching, it will necessary to be also be fluent in a Scandinavian language.
- English requirements for applicants from outside of EU/ EEA countries and exemptions from the requirements:

https://www.mn.uio.no/english/research/phd/regulations/regulations.html#toc8

The purpose of the fellowship is research training leading to the successful completion of a PhD degree.

The fellowship requires admission to the PhD programme at the Faculty of Mathematics and Natural Sciences. The application to the PhD programme must be submitted to the department no later than two months after taking up the position. For more information see:

http://www.uio.no/english/research/phd/

Personal skills

We are looking for highly motivated and ambitious PhD-candidates with good communication skills, problem solving skills, ability to work both independently and in interdisciplinary team.

We offer

- Vibrant international academic environment
- Oslo's family-friendly surroundings with their rich opportunities for culture and outdoor activities
- Good welfare schemes.
- Career development programmes
- Membership in the Statens Pensjonskasse, which is one of Norway's best pension schemes with beneficial mortgages and good insurance schemes.
- Salary in position as Doctoral Research Fellow, position code 1017, in salary range NOK from 536 200 - 575 400, depending on competence and experience. From the salary, 2 percent is deducted in statutory contributions to the State Pension Fund.

Read more about the benefits of working in the public sector at Employer Portal.

Inclusive worklife and diversity at UiO

Inclusion and diversity are a strength. The University of Oslo has a personnel policy objective of achieving a balanced gender composition. Furthermore, we want employees with diverse professional expertise, life experience and perspectives.

If there are qualified applicants with disabilities, employment gaps or immigrant background, we will invite at least one applicant from each of these categories to an interview.

We hope that you will apply for the position.

More information about gender equality initiatives at UiO can be found here.

Application

The application must include:

- Cover letter - statement of motivation and research interests
- CV (summarizing education, positions and academic work - scientific publications)
- Copies of the original Bachelor and Master's degree diploma, transcripts of records and letters of recommendation
- Documentation of English proficiency if applicable
- List of publications and academic work that the applicant wishes to be considered by the evaluation committee
- Names and contact details of 2-3 references (name, relation to candidate, e-mail and telephone number)

Application with attachments must be submitted via our recruitment system Jobbnorge, click "Apply for the position".

When applying for the position, we ask you to retrieve your education results from Vitnemålsportalen.no. If your education results are not available through Vitnemålsportalen, we ask you to upload copies of your transcripts or grades. Please note that all documentation must be in English or a Scandinavian language.

General information

The best qualified candidates will invited for interviews.

Applicant lists can be published in accordance with Norwegian Freedom of Information Act § 25. When you apply for a position with us, your name will appear on the public applicant list. It is possible to request to be excluded from this list. You must justify why you want an exemption from publication and we will then decide whether we can grant your request. If we can't, you will hear from us.

Please refer to Regulations for the Act on universities and colleges chapter 3 (Norwegian), Guidelines concerning appointment to post doctoral and research posts at UiO (Norwegian) and Regulations for the degree of Philosophiae Doctor (PhD) at the University of Oslo.

The University of Oslo has a transfer agreement with all employees that is intended to secure the rights to all research results etc.

University of Oslo

The University of Oslo is Norway's oldest and highest rated institution of research and education with 28 000 students and 7000 employees. Its broad range of academic disciplines and internationally esteemed research communities make UiO an important contributor to society.

The **Department of Chemistry** is Norway's largest institution within research and education in chemistry. Our research excels internationally and we educate students to a wide variety of jobs in industry, academia, research institutions, schools and public administration. Our research ranges from the core topics of chemistry to applied science within in environmental, health, energy and materials. The Department has extensive contacts with industry, research and educational institutions at home and abroad. As partner in the Centre for Materials Science and Nanotechnology our researchers contributes to a significant interdisciplinary efforts in cooperation with the Department of Physics. The Department of Chemistry has its own school laboratory as a great resource for teachers, public outreach and the didactics of chemistry.The

Additional information

Contact persons:

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- For questions regarding Jobbnorge, please contact Nina Holtan, HR Adviser
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Place of service:

Problemveien 7 0313 Oslo (Oslo Municipality)