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PhD Position in Organoid Modelling of Intestinal Epithelial Bacterial Infection

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The Department of Medical Biochemistry and Microbiology (IMBIM) at Uppsala University provides a broad international environment for research and teaching. Research at IMBIM broadly spans the areas of biochemistry, cell and molecular biology, tumor biology, comparative genetics, functional genomics, immunology, bacteriology, and virology. The research is of fundamental nature, but with relevance and application in health and disease in both animals and humans. More info: <https://www.imbim.uu.se/research-areas/>.

Project description

We are looking for person with a strong interest in pursuing a PhD degree at the interface between bacterial infection biology and epithelial cell and tissue biology. We are seeking a highly motivated candidate, with an ability to work both independently and in collaboration with others. The position is one of twelve PhD positions in the new Horizon Europe-funded Marie Skłodowska-Curie Action (MSCA) Doctoral Network “SurfEx - Epithelial Exchange Surfaces: From organizing principles to ex vivo disease models of the gatekeepers of the body” (<https://surfex-project.eu/>)

The mission of SurfEx is to unite academic and non-academic partners and develop new insights into the formation and functioning of epithelial tissues in health and disease. The top (apical) side of epithelial cells is responsible for the exchange of materials with the outside environment, but also for preventing unwanted microbes and other damaging agents to reach deeper tissues. The formation of a functional apical exchange surface requires complex rearrangements of the cytoskeleton, the formation of surface features like cilia or microvilli, and correct molecular specialization (proteins, lipids and carbohydrates). Within SurfEx, research in small model organisms will be combined with novel 3D tissue culture models to unravel the

molecular mechanisms that establish a functional and selective apical exchange surface.

This particular PhD project, linked to Group Sellin at Uppsala University (www.sellinlab.se), will investigate how the intestinal epithelial surface can sustain a dynamic barrier against invasive gut bacteria. The project hinges on the Sellin group's recent development of culture protocols to grow human intestinal epithelial organoids in both 3D and 2D, within chambers compatible with live-cell imaging of ongoing infections. The PhD candidate will study how invasive bacteria such as *Salmonella enterica* and *Shigella flexneri* attack the intestinal epithelial surface, and how the molecular and structural architecture of the epithelial surface affects the outcome of this attack. The work will include a panel of microscopy techniques, use of modern tools for both bacterial and mammalian genetics, and biochemical and omics approaches for molecular characterization of epithelial surface features.

More detailed information about the project can be found here: <https://surfex-project.eu/surfex-projects/dc6/>

The successful candidate will engage in research and doctoral studies. Other duties at the department, i.e. administration and teaching, may be included in the employment up to a maximum level of 20 %.

Examples of recent publications that the project is based on here:

van Rijn & Eriksson et al 2022 - <https://journals.asm.org/doi/10.1128/mbio.00022-22>

Samperio Ventayol et al 2021
- <https://www.pnas.org/doi/full/10.1073/pnas.2013963118>

Geiser et al 2021 - <https://journals.asm.org/doi/10.1128/mbio.02684-20>

Qualifications

The person we are looking for should have a master's degree or equivalent in biomedicine, molecular biology, microbiology, or a related topic, providing both basic theoretical and practical knowledge relevant to the project. Experience in working

with either bacteriology, tissue culture applications, or bioimaging should be demonstrated through an MSc thesis or similar prior project work.

The applicant must be fluent in written and spoken English (see entry requirements at: <https://www.uu.se/en/study/masters-studies/application/entry-requirements>). The candidate is expected to take initiative driving the project, but also to collaborate with other researchers in the group and the doctoral network. Emphasis will be given to personal qualities, including analytical capacity, accuracy, flexibility and collaborative skills.

Please note: This MSCA Doctoral Network grant aims to promote mobility within the EU. Applicants must not have resided or carried out their main activity (work, studies, etc.) in Sweden for more than 12 months in the 36 months immediately before their date of recruitment.

Additional merits or desired skills

The ideal candidate would be familiar with advanced cell and tissue culture methodology, as well as with handling of biosafety level 2 microorganisms. Experience with advanced bioimaging technology (live-cell microscopy, confocal microscopy, scanning electron microscopy et.c.) is a further merit.

The selection is based on the following criteria

Completion of the above qualifications, grades in relevant courses, suitability of the courses to the research program, previous experience in working and/or performing research in the wider area that relates to the project described above. An integrated assessment of the applicant is generated in order to employ the best possible candidate that can succeed in the doctoral studies and contribute to a positive development of the department and the doctoral network research program.

To be employed as a PhD student, the applicant must be accepted in a doctoral program. Information concerning doctoral education, requirements and rules of admission can be found at [Medicine and Pharmacy - Uppsala University \(uu.se\)](#)

The length of the study period for full time employment is a maximum of four years. Terms for graduate studies can be found in Högskoleförordningen 5 kap 1-7 §§ and in: [Uppsala University's rules and guidelines](#).

About the employment

The employment is a temporary position according to the Higher Education Ordinance chapter 5 § 7. Scope of employment 100 %. Starting date as soon as possible or as agreed. Placement: Uppsala

For further details, please contact: Mikael Sellin, mikael.sellin@imbim.uu.se

Application: Please submit your application using the Uppsala University application portal, by including a CV, a letter describing your research interest and skills, publications or a copy of master thesis or equivalent, and contact information of two referees (phone number and e-mail address).

You are welcome to submit your application **no later than November 22, 2023, UFV-PA 2023/3716**

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Read more about our benefits and what it is like to work at Uppsala University <https://uu.se/om-uu/jobba-hos-oss/>

Please do not send offers of recruitment or advertising services.

Submit your application through Uppsala University's recruitment system.

Placement: Department of Medical Biochemistry and Microbiology

Type of employment: Full time , Temporary position

Pay: Local agreement

Number of positions: 1

Working hours: 100

Town: Uppsala

County: Uppsala län

Country: Sweden

Union representative: Saco-rådet saco@uadm.uu.se

ST/TCO tco@fackorg.uu.se

Seko Universitetsklubben seko@uadm.uu.se

Number of reference: UFV-PA 2023/3716

Last application date: 2023-11-22

[Apply for position](#)