PhD Student, 100% in Therapeutic Cancer Vaccines and Tumor Immunology

Our group is affiliated with the Department for BioMedical Research at the University of Bern and the University Clinic of Rheumatology and Immunology at Inselspital, Bern. Our research focuses on the innovative design and development of therapeutic cancer vaccines based on virus-like nanoparticles for the effective treatment of solid tumors in mouse models to provide proof-of-concept.

Project description

Solid cancers such as breast cancer, melanoma, and head and neck cancer remain major global health challenges due to their high incidence, aggressive progression, and limited treatment options. These tumors frequently metastasize or develop resistance to conventional therapies, contributing significantly to cancer-related mortality and highlighting the need for innovative therapeutic strategies. Our group develops therapeutic cancer vaccines based on virus-like particles (VLPs), which are highly immunogenic, non-infectious structures that effectively activate immune cells to recognize and eliminate cancer cells. These vaccines can be tailored as personalized formulations targeting patient-specific mutations or designed as universal vaccines applicable across tumor types. VLP-based vaccination has the potential to induce strong and durable anti-tumor immunity, offering a promising strategy within cancer immunotherapy [5, 6].

The aim of this project is to develop novel therapeutic VLP-based cancer vaccines using AI-driven design approaches. The work will rely on both in vivo and in vitro experimentation, with a strong focus on evaluating immune responses, particularly B-cell activation and complement involvement, in transgenic mouse models. Essential technical skills for this project include VLP-based vaccine design, production and purification via ultracentrifugation, an approved in vivo animal license (LTK), experience with murine cancer models (subcutaneous and orthotopic), and expertise in platforms such as flow cytometry (Aurora), image mass cytometry, and single-cell RNA sequencing. This project will offer opportunities for scientific collaboration and exchange with research groups at the University of Bern as well as leading universities in China. The candidate will benefit from access to well-equipped laboratories and state-of-the-art core facilities.

Requirements

We are looking for a highly motivated candidate with a Master’s degree in life sciences or biomedical sciences. The candidate should have a strong background in immunology and cellular biology. Essential technical skills for this project include VLP-based vaccine design (AI-based software), production and purification of VLPs by ÄKTA and ultracentrifugation, an approved in vivo animal license (LTK) in Switzerland, experience with murine cancer models (subcutaneous and orthotopic), and solid expertise in platforms such as flow cytometry (Aurora), image mass cytometry, RNA-seq, and single-cell RNA sequencing. Strong communication skills in English are required, as the candidate will work in an international team. Knowledge of Chinese is considered an advantage and will support collaboration with partnering institutions in China.The candidate should have a proactive working attitude and the ability to work both independently and as part of a team.

We offer

Our group is well established in the field of vaccinology and tumor immunology and offers an international, dynamic, and team-oriented scientific environment. The PhD student will be fully integrated into the team, will participate in weekly research and lab meetings, and will have the opportunity to develop their scientific know-how.

The position is available from April 1, 2026. The salary will follow the guidelines of the Swiss National Science Foundation (SNF). For any questions regarding the position, please contact Prof. Mona Mohsen (mona.mohsen@unibe.ch) or Prof. Martin Bachmann (martin.bachmann@unibe.ch). Please send your complete application (CV, motivation letter, reference letter, and all diplomas with grades) via email to immunologie@insel.ch by latest January 31st, 2026**.**