Thesis/Intern Student Position

Location: Department of Pathology and Molecular Pathology
Supervisor: Dr. Harini Lakshminarayanan, Moch Group
Start Date: Flexible – June 2025
Duration: 6-8 months

Validating renal cancer protein signatures in patient plasma extracellular vesicles

Clear cell renal cell carcinoma (ccRCC) is a lethal urological malignancy, with 30% of patients presenting with metastasis at diagnosis and another 30% developing recurrent metastasis during progression. Traditional diagnostic methods rely on imaging and histopathology of tumour tissue biopsy, and prognostic algorithms assess broad and generic blood-based biomarkers such as haemoglobin and platelet count that can be aberrant in several pathologies. Such approaches fail to address the dynamic molecular landscape and intra tumoural heterogeneity that contribute to aggressive disease, preventing the early detection of ccRCC and the effective clinical management of patients at high risk for developing metastasis. Secreted, nanoscale, membrane-bound extracellular vesicles (EVs) are promising biomarkers that can be found in circulation, including blood. During ccRCC tumorigenesis, they are implicated in cell communication and metastatic progression. A preliminary investigation of circulating EVs in liquid biopsy plasma samples collected from ccRCC patients shed light on the utility of circulating EVs as potential biomarkers capable of distinguishing between ccRCC and tumour-free samples. These findings lay the foundation for establishing EV proteins as liquid biopsy biomarkers in patient plasma by exploiting the molecular information of circulating EVs. We have defined a ccRCC-specific EV protein signature based on cell culture experiments and will validate this proteomic signature in patient plasma samples.

We are seeking a highly motivated candidate to contribute to this cutting-edge project.

You will be responsible for:

✅ **Performing multiplex flow cytometry experiments** on patient-derived samples, both independently and in collaboration with the team. You will optimize protocols, prepare samples, and analyze data to ensure high-quality results.
✅ **Performing multiplex bead immunoassay** on patient-derived samples, both independently and in collaboration with the team. You will optimize protocols, prepare samples, and analyze data to ensure high-quality results.
✅ **Participating in experimental design, data analysis, and result interpretation** in collaboration.
✅ **Documenting experimental workflows**, ensuring reproducibility and compliance with biosafety regulations.
✅ **Engaging in lab meetings to present your findings**, get feedback, and stay up to date with recent advancements in the field through journal clubs

What we offer:

🔬 **Hands-on experience in a clinical research setting**: Work at the intersection of molecular biology, pathology with a translational approach.
🧪 **Comprehensive training in handling patient samples and biosafety protocols**: Learn best practices for working with clinical specimens and ensure compliance with ethical and regulatory guidelines.
🛠️ **Access to state-of-the-art equipment:** Utilize cutting-edge nano flow cytometry, immunoassay platform for biomarker research.
💡 **Direct access to a liquid, solid, and living biobank**: Work with a rich collection of patient samples, providing a unique opportunity for translational research and understanding biobanking
🚀 **Career development support**: We encourage participation in workshops and networking events to help you advance your career.

Who Should Apply?

We welcome applications from **students currently enrolled in a university program (Bachelor's or Master's) in biomedical sciences, molecular biology, biochemistry, biotechnology, or a related field.**

✅ This position is particularly suitable for students looking for a **thesis project or research internship as part of their degree program.**
✅ Prior experience with flow cytometry, extracellular vesicles, or liquid biopsy approaches is a plus but **not required**—training will be provided.
✅ Enthusiasm, curiosity, and a proactive attitude are highly valued!

How to Apply?

Write an email to harini.lakshminarayanan@usz.ch with your CV and a short description of your motivation.

Fill in form to be contacted: https://forms.gle/gsSTyvkNhFNjGHqq8