MASTER THESIS PROJECT:

Leveraging patient-derived organoids to study drug response and treatment resistance in advanced prostate cancer

Project outline

While most patients with advanced prostate cancer (PCa) initially respond to androgen deprivation therapy (ADT), the majority of them will eventually develop castration-resistant prostate cancer (CRPC), for which therapeutic options are not curative. A better understanding of PCa progression is a prerequisite to address this clinical challenge, which requires models that recapitulate the molecular and cellular complexity characterizing PCa. In the last decade, novel three-dimensional (3D) models derived from patients' material and referred to as patient- derived organoids (PDOs) have been developed. Yet, in the context of prostate cancer (PCa), PDOs have been associated with low success rates, preventing their widespread use for translational studies and leading to a shortage of models emulating specific disease states. One hypothesis is that PCa cells require key signals for their maintenance and expansion which are lacking in the current culture conditions and may be specific to distinct PCa types. Thus, culture conditions that are more adapted to the unique characteristics of PCa cells are needed. The proposed master project aims at tackling this challenge and defining optimal culture conditions for the growth and expansion of cancerous luminal cells by modifying the current culture medium composition, the type and density of extracellular matrix, glucose concentrations, and oxygen levels.To address this question, the project will rely on primary tissue processing, patient-derived organoid culture, 2D/3D cell culture, co-culture, Immunofluorescence, Immunohistochemistry, H&E staining, Whole-mount microscopy, Drug Treatments, Viability assays, and DNA/RNA extraction analyses.

Research Group

Translational Genitourinary Cancer Research (TGCR) Laboratory, Department of Biomedicine, Institute of Pathology, Department of Urology
Group Leader : Dr. Clémentine Le Magnen
https://biomedizin.unibas.ch/en/research/research-groups/le-magnen-lab/

Your profile

We are looking for a motivated and curious individual with good English communication skills and strong interest in cellular biology and translational cancer research.

Application

To apply for the position send your application comprising an updated CV and short motivation statement to Robin Dolgos (robin.dolgos@usb.ch) and Dr. Clémentine Le Magnen (clementine.lemagnen@usb.ch)