



EBERHARD KARLS  
UNIVERSITÄT  
TÜBINGEN



## CSC-Tübingen PhD Scholarship Program

2025/2026 application round: prospective PhD positions at the University of Tübingen

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Faculty: Medicine

Institute / Section / Subject: Department of Pathology and Neuropathology, Institute of Pathology and Molecular Pathology. Research subject: Imaging and function of the immune synapse

Supervising Professor(s): Prof. Dr. med. Christian M. Schürch, MD, PhD

About the Supervisor(s): I am a board-certified surgical pathologist with >15 years of basic science experience (tumor immunology of leukemias & lymphomas, tumor mouse models, tumor microenvironment, highly multiplexed tissue imaging with >80 simultaneous protein markers, 3D tissue perfusion bioreactors). I am also founding member, vice-president and treasurer of the European Society for Spatial Biology (ESSB). Recent publications: Li et al., *Blood* 2025, in revision; Zhang et al., *Theranostics* 2025, in revision; Mayer et al., *Science Advances* 2023; Shekarian et al., *Science Advances* 2022; Phillips et al., *Nature Communications* 2021; Schürch et al., *Blood* 2021; Schürch et al., *Cell* 2020; all publications and personal website: [www.schurchlab.com](http://www.schurchlab.com)

Specification/Project title: **Bioreactor-Based Ex Vivo Culture of Human Cancer Tissues for Functional Precision Medicine and Co-Clinical Immunotherapy Trials**

Topic Description:

Immunotherapies, particularly immune checkpoint inhibitors (ICIs) and CAR T cells, have revolutionized cancer treatment. Yet, variability in patient response and the development of resistance underscore the need for functional precision medicine strategies to guide therapy selection. Traditional in vitro models fail to capture the complexity of the tumor microenvironment, limiting their predictive capacity.

This project will develop patient-derived 3D perfusion bioreactor cultures using live cancer tissue from melanoma lymph node metastases and lymphoma lymph nodes, preserving the native tumor microenvironment, including immune and stromal components. These models will be used to test functional responses to ICIs, CAR T cells, and other immunotherapies, alone or in combination. To achieve dynamic insight into therapeutic activity, we will integrate live tissue and cell microscopy, enabling direct visualization of CAR T–tumor cell interactions, infiltration, and killing dynamics in real time. The platform will be applied within a co-clinical trial framework, allowing parallel evaluation of patient-derived samples and matched clinical cases to determine whether ex vivo functional precision medicine results predict actual patient responses to immunotherapies.

We will combine bioreactor engineering, live-cell imaging, multiparametric functional assays, highly multiplexed tissue omics, and molecular profiling to dissect mechanisms of sensitivity and resistance.

Ultimately, this research aims to establish bioreactor-based functional precision medicine as a clinically actionable platform for melanoma and lymphoma, accelerating the translation of immunotherapy into individualized treatment strategies.

Intended Degree: PhD in Experimental Medicine

Type of the PhD Study: Full-time (complete doctoral studies at the University of Tübingen)

Required Degrees and Qualifications: Master's degree in medicine, biology, biotechnology, or related discipline

Language Requirements: Proficiency in English (scientific level oral/written; CEFR B2-C1)

Notes: PhD candidates with strong experimental skills; a solid background in immunology and cell biology, and/or bioinformatics would be an advantage.