



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: Highly multiplexed microscopy of the leukemia bone marrow microenvironment

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: **Integrative 2D–3D Imaging and Multi-Omics to Dissect Tumor–Immune Interactions and Therapy Response**

Topic Description:

Understanding the complexity of tumor–immune interactions in both primary and metastatic niches is essential for advancing immunotherapy and chemotherapy. Conventional 2D assays such as multiplexed imaging or spatial transcriptomics provide detailed molecular insights but lack global spatial context, while 3D imaging preserves intact tissue architecture but offers limited mechanistic resolution. To overcome these limitations, this project will establish an integrated 2D–3D framework to study immune–tumor interactions across different cancer types and therapeutic conditions.

We will employ 3D light-sheet fluorescence microscopy after tissue clearing to map metastatic sites and immune landscapes in mouse organs (lung, liver, brain) as well as cleared human tumor samples. Guided by these 3D maps, targeted tissue sections will then be subjected to 2D high-resolution analyses, including CODEX multiplexed imaging and spatial analysis of immune interactions, as well as laser capture microdissection followed by spatial RNA and multi-omics profiling. This multi-scale approach will allow us to connect the global architecture of metastasis with the fine-grained molecular programs of immune and tumor cells.

By integrating 3D whole-organ mapping with 2D cellular and molecular dissection, this project will

uncover how tumor–immune dynamics vary across tissue environments, how they influence therapeutic outcomes, and why responses differ between patients. The ultimate goal is to identify novel biomarkers of sensitivity and resistance and to inform more effective applications of immunotherapy and chemotherapy in cancers.

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 experience in bioinformatics and mouse models would be an advantage.