

Postdoctoral Position in Single Molecule Microscopy and Immunology in the Lillemeier Laboratory at the University of Freiburg (Germany)

(<https://lillemeier.biologie.uni-freiburg.de>)

The Lillemeier Lab is seeking a highly creative, collaborative, and motivated postdoctoral researcher who is interested in visualizing immune responses in T cells using single molecule microscopy.

Our group is interested in the regulation of lymphocyte activity and functions during cancer and autoimmunity. Current research is focused on the activating T cell receptor (TCR) and inhibitory PD1 pathways in T cells. We apply multidisciplinary approaches that combine cutting-edge fluorescence microscopy with biophysics, biochemistry and molecular biology to elucidate how protein conformations, modifications and assembly at the plasma membrane control signal transduction. Specifically, we have discovered that the T cell signaling pathways are segregated into distinct plasma membrane nanodomains (a.k.a. protein islands) that concatenate upon T cell stimulation. We are studying how the signaling pathways utilize nanodomains distribution and dynamics, and how signals are exchanged between them. We aim to identify and modulate spatio-temporal mechanisms that are specific to signaling proteins and/or pathways. Newly identified mechanisms are characterized and targeted in situ and in vivo, including in mice, to modulate anti-tumor responses and autoimmunity. Our goal is to determine the potential of these mechanisms as future drug targets for immunotherapies.

Multiple projects are available to study spatio-temporal mechanisms that control the assembly and signal transduction of the TCR and PD1 pathways at the plasma membrane, as well as the interaction and communication between them and other T cell signaling pathways.

We have three custom-built state of the art microscope systems that are exclusively dedicated to research in the Lillemeier laboratory. Two of these systems were purchased in 2023. Imaging modes frequently utilized for our research include (1) 'Ring' – Total Internal Reflection Fluorescence (TIRF), (2) Widefield or (3) Fluorescence Recovery after Photobleaching (FRAP). Our systems are ideally suited for an array of cutting-edge fluorescence microscopy techniques, specifically single molecule microscopy [i.e. Single Molecule Tracking and Super resolution Microscopy (PALM/STORM)]. Furthermore, we have access to multiple imaging core facilities that allow access to a broad array of additional fluorescence and electron microscopy imaging techniques.

This full-time postdoctoral position is available immediately (starting date as early as possible) for an initial term until 31st of December 2025 with possibility of extension. We encourage applicants from different areas, e.g. immunology, biology, physics and engineering, with expertise in fluorescence (preferably single molecule) microscopy and a strong interest in immunology. Some experience with programming or relevant software (e.g. Matlab, Micro-Manager and OriginLab) will be beneficial. This position requires a Ph.D. degree (or equivalent), and publication(s) in peer-reviewed journals. We are particularly pleased to receive applications from women for the position advertised here.

To Apply:

Please submit (1) a letter of motivation including a description of current research accomplishments and future research interests/goals (not more than two pages), (2) curriculum vitae (CV) with publication list and (3) at least three contact details for referees. Send your application in a single pdf file to: lillemeier@bio.uni-freiburg.de

