

Master's Thesis Project in Tumor Immunology

Molecular characterization of antibodies from tumor-infiltrating B cells

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Project Overview:

B cells are an essential component of the adaptive immune system and are involved in immune responses against invading pathogens. B cells also play an important role in modulating the tumor microenvironment by forming organized lymphoid structures known as tertiary lymphoid structures (TLS). These structures serve as local immune hubs, facilitating antigen presentation, and the coordination of both cellular and humoral immune responses. Despite the clinical significance of TLS, the specific antigens targeted by antibodies produced in these structures remain largely unknown.

In our research group, we employ state-of-the-art sequencing techniques to identify and characterize the adaptive immune receptor repertoires of tumor-infiltrating B cells. By integrating these high-dimensional datasets, we can trace B cell lineages, determine clonal relationships, and assess B cell affinity maturation within TLS. In this project, we aim to molecularly characterize the antibodies secreted by tumor-infiltrating B cells, analyze their binding specificities, and evaluate their functional roles in tumor immunity.

Experimental Methodology:

The selected Master's student will recombinantly express and test specific antibody candidates derived from tumor-infiltrating B cells. Laboratory methodology includes:

- Processing of tumor material (tissue sectioning, dissociation, and single-cell isolation)
- FACS staining of primary tumor cells and cell lines
- ELISA assays against known tumor-entity-specific antigens
- Immunoprecipitation for target antigen identification

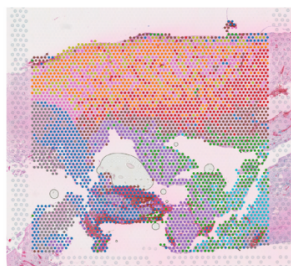
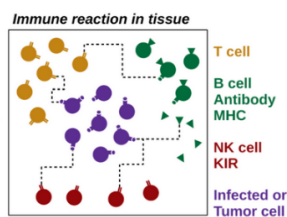
Your Profile:

- Master's student in biology, biophysics, biochemistry, or related fields
- Experience in laboratory techniques, including molecular cloning or flow cytometry
- Strong motivation to work as part of an international and interdisciplinary research team
- Fluency in English (German language skills are beneficial)

If you are interested, please apply via email to imkeller@rz.uni-frankfurt.de and send your CV, degrees, transcript of records and a brief motivation letter detailing your relevant experience.

Further information

Cakmak P, Lun JH, Singh A, Macas J, Schupp J, Köhler M, Starzetz T, Burger MC, Steidl E, Hasse LM, Hattingen E, Plate KH, Reiss Y, Imkeller K. Glioma-associated tertiary lymphoid structures are sites of lymphocyte clonal expansion and plasma cell formation. *bioRxiv*; 2024. doi: 10.1101/2024.07.04.602038.



Antibody-antigen binding

