Master of Science Thesis Position

for **9-12 months** (start: as soon as possible) in the **laboratory of Prof. Dr. Burkhard Becher**, Institute of Experimental Immunology, University Zurich

Supervisor: Dr. Stefanie Kreutmair

Research Topics:

1. Drug response profiles in Acute Myeloid Leukemia (40% wet lab, 60% dry lab)

Most patients with Acute Myeloid Leukemia (AML) still undergo a traditional "one-size-fits-all" therapeutic approach (mostly chemotherapy) resulting in dismal outcome and median survival of 12-14 months for patients >60 years. While immunotherapies in solid cancer and B cell lymphoma represent a success story, this is not yet the case for AML – although T cells seem to be a key player in anti-leukemia immune responses as shown by hematopoietic stem cell transplantation and donor lymphocyte infusion. Based on previous results, we identified distinct immune profiles in AML and want to exploit the identified targets for combinatorial immunotherapy. **The prospective candidate** will treat AML samples in vitro with different selected drug combinations and analyze them by high-parametric single-cell cytometry to investigate on-target (AML cells) and off-target (immune cells) effects. Optional, promising combinations will further be tested in vivo using AML mouse models. **This project and with this the candidate has the potential to identify novel immunotherapeutic combinations for specific AML subtypes**.

2. First-in-human WT1 recombinant protein vaccination in patients with Acute Myeloid Leukemia (10% wet lab, 90% dry lab)

We have a **unique opportunity** as we have access to a generated dataset and patient samples collected within **a real phase I/II clinical trial**, which has been initiated to analyze the treatment effect and toxicity of a first-in-human vaccination strategy based on WT1 recombinant protein in elderly AML patients. Preliminary analysis of five treated AML patients points to clinical and immunological efficacy together with an acceptable safety profile. **The prospective candidate** will I) evaluate toxicity and clinical activity induced by the vaccination (with statistical support), II) investigate the humoral and cellular immune response in vaccinated AML patients using clinical trial datasets and perform high-parametric single-cell cytometry (panel design, data analysis including FlowJo and R studio), and III) based on the generated immune map, correlate it with patient immune responses and outcome to gain mechanistic insights in anti-WT1 and anti-AML immunity. **This project offers the unique potential to work with a real clinical trial dataset and has the potential to introduce this innovative immunotherapeutic strategy for future AML therapy.**

We offer:

- Translational research projects linking basic immunological and clinical research
- A highly dynamic young and international team in a thriving research environment in the Institute of Experimental Immunology at the University Zurich
- Cutting-edge equipment (Spectral flow cytometer etc.)
- Weekly group meetings, journal flow, seminars

Requirements:

- Genuine interest in immunological research
- High motivation
- Experience in flow cytometry (FlowJo) and programming skills (R studio) are a plus

Applications:

Applications (English/ German) should include a CV containing a brief statement of research experiences.

Please send your application to: kreutmair@immunology.uzh.ch