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As German Research Center for Environmental Health, Helmholtz Zentrum München pursues the goal of developing personalized medical approaches for the prevention and therapy of major common diseases such as diabetes mellitus, lung diseases and allergy. To achieve this, it investigates the interaction of genetics, environmental factors and lifestyle. The institute for diabetes research (IDF) is part of the Helmholtz Diabetes Center (HDC) and located in the north of Munich. Given the dramatically rising incidence in diabetes the projects described below aim to dissect the underlying mechanisms of diabetes development and progression, where aberrant immune activation plays a major role.

We are a young lab with a focus on immune tolerance. Our main interests are cellular mediators of immune tolerance – so-called regulatory T cells (Tregs) and how they are dysregulated in autoimmune diseases (mainly Type 1 diabetes) or in conditions of chronic inflammation as observed in obesity and Type 2 diabetes. To answer our research questions we focus on respective mouse models and we are particularly interested in T cell populations including Tregs isolated from various tissues and peripheral blood. For Type 1 Diabetes research, we employ the non-obese diabetic (NOD) mouse as well as innovative humanized mouse models, in order to bridge the translational gap between mouse models and the human disease. In the obesity setting, we study the impact of different environmental and dietary challenges and analyze changes in T cell mediated inflammation and tolerance directly in relevant target areas such as adipose tissue.

## Projects for Research Internship and/or Master Thesis

- 1. Immune tolerance in autoimmune Type 1 Diabetes – Characterization of T cell responses in early onset islet autoimmunity**  
(*Internship and/or Master Thesis*)
- 2. Mechanisms of immune activation in autoimmune Type 1 Diabetes – Role of Th9 cells**  
(*Master Thesis*)
- 3. Role of Insulin-like-growth factor 1 and related receptors for T cell differentiation and function in diabetes**  
(*Internship and/or Master Thesis*)

### General methods:

- Flow cytometry and cell sorting (FACS)
- Isolation of T cells from various murine tissues and/or human peripheral blood
- mRNA/miRNA expression analysis from tissue and/or sorted cells
- regulatory T cell induction assays *in vitro*
- Isolation and phenotyping of insulin-specific T cells
- ELISA for autoantibody detection in murine NOD plasma

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**Your qualifications:**

- High scientific interest
- Initiative, high motivation and problem-solving abilities for complex scientific questions
- Willingness to work with laboratory mice essential (experience not required but beneficial)
- Background knowledge in Immunology beneficial
- Good communication and presenting skills in English

**Our offer:**

- Positive working atmosphere in a young and highly motivated scientific environment
- State-of-the-art technologies
- Training for work with laboratory animals (if required)
- Direct and interactive supervision
- Weekly immunology meeting with scientific discussion for a broad overview of current immunological questions

**For further information, please contact:**

Please send inquiries with detailed CV (focus on previous lab and method experience) to

**Contact:**

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