Helmholtz Zentrum München Deutsches Forschungszentrum für
Gesundheit und Umwelt (GmbH), Heidemannstraße 1, 80939 München

To all interested **master's students** looking for a

Research internship and/or Master Thesis in
Immunological Diabetes Research at the
Research Unit for Type 1 Diabetes Immunology
Helmholtz Diabetes Center
Helmholtz Center Munich

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The **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 allergies. Therefore, it investigates the interaction of genetics, environmental factors, and lifestyle. The research unit for Type 1 Diabetes Immunology (TDI) is part of the Helmholtz Diabetes Center (HDC) and **located in the North of Munich**. Our main interests are the cellular mediators of immune tolerance – so-called Foxp3$^+$ regulatory T (Treg) cells. Treg impairments are strongly associated with progression of islet autoimmunity to overt Type 1 Diabetes (T1D). The specific mechanisms linking Treg impairments to pancreatic islet inflammation remain unclear, making it crucial to investigate pancreas-infiltrating Tregs and their role in islet autoimmunity. To answer our research questions, we focus on respective mouse models and are particularly interested in T cell populations including Tregs isolated from various lymphoid and non-lymphoid tissues. Our different mouse models include diabetes models, gain- and loss-of-function models.

Possible Project for a Research Internship and/or Master Thesis

Impact of CCR4 ligands on tissue Treg cells in islet autoimmunity

Chemokine ligand (CCL) 22 and CCL17 are important mediators of T-cell trafficking with supposed anti- and pro-inflammatory properties respectively and transduce signal to Tregs via the Chemokine receptor (CCR) 4, highly expressed on Tregs. CCL22-CCR4 interaction leads to Treg migration and dendritic cell (DC)-Treg crosstalk resulting in immune suppression, however the latter has not yet been fully demonstrated.
The current project aims to investigate the involvement of CCL22/17-CCR4 axis in the context of islet autoimmunity preceding overt T1D and study its effect on Treg induction, stability, and function with particular attention to pathological implications.

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General methods depend on the project progress but usually include:

- Multi parameter conventional and spectral flow cytometry and cell sorting (FACS)
- T cell differentiation assays *in vitro*
- Treg stimulation and co-culture assays *in vitro* to assess Treg functionality
- ELISA assays for marker detection on murine and human samples
- mRNA expression analysis from tissue and/or sorted cells by real-time qPCRYour qualifications:
- Highly motivated with a profound scientific interest
- Initiative and problem-solving abilities for complex scientific questions
- Willingness to work with laboratory mice is essential (experience not required but beneficial)
- Background knowledge in Immunology is beneficial
- Good communication and presentation skills in English

Our offer:

- Positive working atmosphere in a young and highly motivated scientific environment
- State-of-the-art technologies
- Training to work with laboratory animals (for master students)
- Possibility of collaboration with external laboratories
- Direct and interactive supervision
- Weekly meeting with scientific discussion for a broad overview of current immunological questions, research in progress updates and weekly 1:1 meetings to discuss the project

For further information, please contact Gianmarco Spata or Isabelle Serr directly.
Please send inquiries with your short motivation letter, a detailed CV (focus on previous lab and method experience) and the latest transcript of records combined in a single PDF via Email to

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