

PhD Position – Human Immunometabolism and the Gut-Liver Axis (m/f/d)

Department of Internal Medicine III, RWTH Aachen University Hospital
DFG Collaborative Research Centre (CRC) 1382 – Gut-Liver Axis

Duration: 3 years (fully funded)

Planned start: October 2026

About the project

Patients with advanced chronic liver disease (ACLD) frequently develop life-threatening bacterial infections despite exhibiting profound systemic inflammation. Understanding why immune cells progressively lose their host defence function during disease progression remains one of the major unanswered questions in hepatology. We are seeking a highly motivated PhD candidate to join a newly established research programme investigating **human immunometabolism** within the DFG-funded Collaborative Research Centre (CRC) 1382 *Gut–Liver Axis*. The project combines clinical research with mechanistic immunology to understand how immunometabolic programmes regulate immune cell function during progression from compensated cirrhosis to acute-on-chronic liver failure (ACLF). Using unique longitudinal patient cohorts, we aim to identify the metabolic pathways driving immune dysfunction and determine whether these pathways can be therapeutically restored. Ultimately, this work seeks to establish immunometabolism as a novel therapeutic target in advanced liver disease.

Your research

The project combines patient-oriented translational research with state-of-the-art immunology and metabolic profiling. During your PhD, you will investigate how immune cell metabolism changes across different stages of liver disease and how gut-derived inflammatory signals contribute to immune dysfunction.

You will receive extensive training in cutting-edge technologies, including

- High-dimensional multicolour flow cytometry
- Single-cell metabolic profiling (SCENITH)
- Mitochondrial functional assays (i.a. Seahorse)
- Functional T-cell and monocyte assays
- Multiplex cytokine profiling (Luminex)
- Targeted metabolomics
- Single-cell RNAseq
- Bioinformatic analysis of high-dimensional datasets

Your responsibilities

- collect, process and biobank blood and ascitic fluid as well as liver tissue samples from patients with advanced liver disease
- perform immune phenotyping using multicolour flow cytometry
- characterise immune cell metabolism using SCENITH and complementary metabolic analyses
- investigate T-cell and monocyte function using proliferation, cytokine production and phagocytosis assays
- analyse inflammatory mediators and metabolic biomarkers using ELISA, Luminex and related technologies
- contribute to experimental design, optimisation of laboratory protocols, troubleshooting and interpretation of complex datasets
- present your work within CRC1382 meetings and at national and international conferences
- contribute to scientific publications and collaborative research projects

Your profile

We welcome applications from enthusiastic and curious candidates who enjoy working at the interface of immunology, metabolism and clinical medicine.

- a Master's degree (or equivalent) in Immunology, Molecular Biology, Biomedical Sciences, Biochemistry or another relevant life science discipline
- a strong interest in translational immunology, immunometabolism or inflammatory diseases
- practical laboratory experience in molecular biology, cell biology or immunology
- experience with flow cytometry, primary immune cell culture, cell isolation or immunological assays is highly desirable.

- excellent organisational skills, scientific curiosity and the willingness to independently learn and implement new experimental techniques.
- a strong analytical thinking, problem-solving ability and enthusiasm for collaborative research.
- excellent English language skills
- previous experience with metabolomics, mitochondrial biology, bioinformatics or single-cell technologies is advantageous but **not required**. Candidates with a strong motivation to acquire these skills during their PhD are strongly encouraged to apply.

We offer

- a **fully funded** three-year PhD position within the prestigious **DFG Collaborative Research Centre (CRC) 1382 – Gut-Liver Axis**.
- a highly translational research project addressing clinically relevant questions in human immunometabolism
- access to unique, well-characterised patient cohorts and longitudinal clinical samples from patients with advanced liver disease.
- close supervision by experienced basic and clinician scientists with an excellent publication record and strong international collaborations
- training in cutting-edge technologies and access to state-of-the-art core facilities
- close interaction with clinicians, immunologists, microbiologists, metabolomics specialists and computational biologists within the CRC1382
- structured doctoral training through the Biomedical Graduate School (BMGS), including transferable skills courses and career development programmes
- opportunities to present your work at international conferences and build an international scientific network
- an open, collaborative and supportive research environment and salary according to the German public service pay scale (TV-L), including social security and pension benefits

Why join us?

This project offers the opportunity to work at the interface of **basic immunology, metabolism and clinical medicine**, using human patient samples to answer fundamental questions with direct clinical relevance. You will become part of an **interdisciplinary consortium** investigating the gut–liver axis and will be encouraged to develop your own scientific ideas, contribute to high-impact publications and grow as an independent scientist.

Application

Please submit a single PDF containing

- Cover letter describing your motivation and research interests
- Curriculum vitae
- Academic transcripts
- Contact details of two academic referees

Applications should be sent to:

Theresa Wirtz: thwirtz@ukaachen.de

Oluwatomi Ibidapo-Obe: oibidapo@ukaachen.de

Application deadline: 31 August 2026