# Job Advertisements within the CRC/TRR 225

The Collaborative Research Centre/Transregio **CRC/TRR 225 "From the Fundamentals of Biofabrication towards Functional Tissue Models"** is an interdisciplinary research consortium of the Universities of **Würzburg, Bayreuth, and Erlangen-Nürnberg**.

The TRR225 aims to develop innovative biofabrication strategies - particularly automated 3D printing technologies - for processing living cells and biomaterials into complex tissue constructs. These advanced in vitro models provide new opportunities for pharmaceutical, cancer, and infection research, support the reduction of animal testing and offer long-term perspectives for regenerative medicine.

Since its establishment in 2018, the consortium has achieved substantial scientific progress and international visibility and will enter its third funding period in 2026.

The advertised position is part of the subproject **C06, "Biofabrication strategies for modelling kidney compartments and diseases"**, which focuses on developing physiologically relevant in vitro models of key renal structures through advanced biofabrication approaches. This includes further refinement of a dynamic glomerular filtration barrier model using human-induced pluripotent stem cell (hiPSC)-derived podocytes and patient-specific glomerular cells to study disease mechanisms, circulating factors, and therapeutic responses under controlled biomechanical conditions. In parallel, the project aims to fabricate a progressively complex proximal tubule model using melt electrowriting-based scaffolds, hydrogel-embedded stromal cells, and compartmentalized perfusion to recreate tubular microarchitecture and function. Additionally, C06 integrates kidney into engineered fibrous grids to promote guided vascularization and maturation within bioreactors. Together, these models will enable high-fidelity investigation of renal pathology, support personalized medicine applications, and contribute to reducing the need for animal experimentation.

## PhD candidate (f/m/d)

**Your responsibilities**

The project is highly interdisciplinary, combining biological research led by Universitätsklinikum Erlangen with biofabrication approaches led by the University of Würzburg. This PhD position will primarily focus on the **biofabrication and biomaterials engineering aspects** of the project and will work in close collaboration with the PhD candidate based in the nephrology group, ensuring continuous exchange and integration between both disciplines.

The position includes, but is not limited to:

- Task 1: Design and fabrication of advanced melt electrowritten (MEW) polymer scaffolds.
- Task 2: Development and optimization of scaffold surface modification strategies to support adhesion, maturation, and polarization of kidney and vascular cells.
- Task 3: Design, construction, and refinement of bioreactor and perfusion systems that apply controlled flow and physiological pressure.
- Task 4: Structural, mechanical, and physicochemical characterization of scaffolds and constructs (e.g. SEM, mechanical testing, porosity/geometry analysis, flow profiles), and close interaction with biological partners to correlate material properties with cellular responses.
- Task 5: Support in the bioassembly of kidney organoids and their integration into dynamic culture systems.
- Task 6: Data analysis and documentation (e.g. quantitative image analysis, structure–function correlations), preparation of reports, presentations, and contributions to scientific publications.
- Task 7: Active engagement in collaboration within the CRC/TRR network, regular communication with associated subprojects, and support of knowledge exchange between materials science and nephrology.
- Employment level and contract duration: Full-time position (67%, E13 TV-L), fixed-term according to the project funding period (4 years).
- Expected starting date and place of work: Start date by mutual agreement; primary workplace at the University of Würzburg, Department for Functional Materials in Medicine and Dentistry (FMZ), biofabrication group (Groll/Ahmad).

## Requirements

Required qualifications:

- Completed university degree (Master or equivalent) in Biomedical Engineering, Materials Science, Mechanical Engineering, Biotechnology, Physics, Chemistry, or a closely related field.
- Demonstrated hands-on experience in biomaterials, polymer processing and/or additive manufacturing (e.g. 3D printing, electrospinning, MEW, microfabrication).
- Interest in 3D in vitro tissue models, organ-on-chip approaches, and translation of material design into functional biological systems.
- Basic experience in laboratory work; openness to acquire skills in mammalian cell culture and handling of biological samples in close collaboration with the Erlangen group.
- Familiarity with CAD-based design (e.g. SolidWorks, Fusion 360 or similar) for scaffold and bioreactor component design.
- Strong communication skills and the ability to work in an interdisciplinary, collaborative research environment bridging biomaterials and nephrology.
- Good command of English (written and spoken).

## What We Offer

- Interdisciplinary, collaborative research environment
- Access to state-of-the-art equipment and facilities
- Structured PhD training programs (if applicable)
- Opportunities for conference attendance and research stays
- Support for career und personal development

## Equal Opportunity & Diversity Statement

We are committed to equal opportunity and diversity and explicitly encourage women to apply. Candidates with disabilities will be given preference if their qualifications are equivalent. We offer an inclusive, supportive, and collaborative working environment.

## Contact

For inquiries or to submit your application, please contact the person below. Please submit your documents by 19th December.

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## Attachments (optional)

Please include:

- CV
- Motivation letter
- References (if available)