Postdoctoral Fellow in Cell and Tissue Mechanics: Mechanoregulation of Epithelial Cell Extrusion

Friedrich-Alexander-Universität, Erlangen, TV-L E 13, Full time, Temporary employment: 24 months, Bewerbungsschluss: 19.03.2026

Your Workplace

The Chair of Biophysics Professor Benoit Ladoux (Alexander von Humboldt professor) is looking for a new Postdoctoral Fellow. The Chair is located in the new building of the Max Planck Center for Physics and Medicine in Erlangen.

Benefits: We Have a Lot To Offer

- Regular promotion to the next level and increase in salary pursuant to the collective bargaining agreement for the public service of the German Länder (TV-L) or remuneration pursuant to the Bavarian Public Servants Remuneration Act (BayBesG) plus an additional annual bonus
- 30 days annual leave at five working days per week with additional free days on December 24 and 31
- Occupational pension scheme and asset accumulation savings scheme

Your Tasks

We are seeking a highly motivated **postdoctoral fellow with a strong biological background** to join our interdisciplinary team at the interface of **cell biology, biophysics, and tissue mechanics**.

Project Overview

Epithelial tissues cover most internal and external surfaces of the body and must continuously adapt to environmental challenges while preserving barrier function. A key regulatory mechanism is **cell extrusion**, a process by which epithelial cells are eliminated from the monolayer, either as apoptotic cells or as living cells during EMT, morphogenesis, or early tumor invasion.

Our recent work highlights that **mechanical forces, cell packing, and tissue stresses** are major drivers of extrusion. However, **how cells sense mechanical stress and how force determines cell fate** remain largely unknown.

This project aims to understand how feedback between mechanics, adhesion, and signaling controls tissue homeostasis. We will particularly focused on the impact of physical cues on caspase activation, the role of neighboring cells, cell-cell adhesion and cytoskeleton perturbations during cell extrusion.

Research Objectives

The postdoc will investigate:

- How **mechanical forces influence the fate** of extruded cells (live vs apoptotic)

- How epithelial cells **sense and respond to mechanical stress**
- How extrusion contributes to **tissue remodeling, morphogenesis, and tumor progression**

Experimental Approach

We use **in vitro epithelial models and ex vivo intestinal organoids**, combining:

- Cell and molecular biology
- Live-cell and tissue imaging
- Cytoskeleton and adhesion analysis
- Microfabrication and mechanical perturbations
- Quantitative image analysis

This multidisciplinary project integrates **physics-based approaches with experimental cell biology**.

Your Profile

Candidate Profile

- PhD in **cell biology, developmental biology, or related fields**
- Strong interest in **mechanobiology and tissue dynamics**
- Experience in **cell culture, molecular biology and microscopy**
- Motivation to work in a **cross-disciplinary environment**

Additional Information

Impact

Understanding how mechanics controls cell extrusion will provide new insight into **tissue homeostasis, morphogenesis, and cancer progression**, and reveal fundamental principles of **collective cell behavior**.

Interessiert?

Die vollständige Stellenausschreibung sowie alle Infos zum Bewerbungsverfahren finden Sie hier: