# PhD candidate in biophysics or cell and molecular biology (m, f, d)

Institut für Physik der Kondensierten Materie, Erlangen, Vollzeit, Befristete Anstellung, Bewerbungsschluss: 31.07.2024

**Ihre Aufgaben**

Project description :**Epithelia are assemblies of multiple cells that are crucial for barrier function** and tissue integrity to protect against challenges from the environment. To maintain tissue homeostasis in the face of these challenges, **epithelia balance cell renewal with cell death**. Whereas simple epithelia are monolayered, the skin epithelium, **the epidermis, is a stratified epithelium. Both types of epithelia renew through a continuous flow of dividing and extruding cells**, but whereas in simple epithelia those extruding cells are either lost or reinserted into the monolayer, delaminating stem cells of stratified epithelia differentiate while integrating into a suprabasal layer. Little is known about the cell- and tissue- mechanics of basal cell delamination and generation or renewal of a suprabasal layer. We would like **to address the molecular and mechanical principles that govern cell delamination and subsequent formation of an adhesive distinct suprabasal differentiated layer to generate a basal/suprabasal fate boundary**. We hypothesize that the mechanical and adhesive state of an epithelial determines whether an epithelial monolayer will generate a suprabasal layer to undergo stratification. We will combine quantitative assessment of mechanical forces, nematic ordering, cell shape dynamics in fixed and live cell imaging image analysis, and micropatterning. Our in vitro **multidisciplinary, quantitative approach** is expected to provide insight into how mechanical properties of the tissue participate in **1) cell delamination from the basal layer**, while **2) maintaining a homeostatic partitioning between basal and suprabasal layers** of the epidermis. The innovative approaches that we will develop and apply, will not only provide insights into skin biology and cell extrusion in other epithelia, but also in the general area of the physics of life matter.

Partners or collaborations : Dr. René-Marc Mège (Institut Jacques Monod, CNRS, Paris)Prof. Carien Niessen (Koln, Germany)

The chair is located in the new building of the Max Planck Center for Physics and Medicine in Erlangen.[https://mpzpm.mpg.de/]

**Ihr Profil**

**Notwendige Qualifikationen:**

The candidate should have a master degree in biophysics or cell biology with possibly a prior experience in microscopy and quantitative imaging. The successful candidate is expected to work in an interdisciplinary and international environment. We are looking for highly motivated graduate students with an interest in multidisciplinary science. Positions will be related to experimental approaches

including microscopy, cell culture, and microfabrication.

**Stellenzusatz**

Please send your application documents (application letter, CV, training and employment references) in electronic form (as ONE PDF-file) to Benoit.Ladoux@fau.de

**Interessiert?**

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