

Department:	Institute of Pharmacology and Toxicology
Job site:	University Hospital of RWTH Aachen University
Description of the position:	PhD Position: Interaction of alveolar epithelium and macrophages under mechanical strain
Job description:	Our profile Our research focus lies on the investigation of molecular mechanisms underlying the pathogenesis of the acute respiratory distress syndrome (ARDS), a life-threatening frequently occurring inflammatory lung disease for which to date no pharmacological cure is available. The only life-saving intervention in ARDS is mechanical ventilation, although it has been shown that mechanical forces aggravate pre-existing inflammation in the lung. The underlying molecular mechanisms are not well understood and are therefore subject of our research. In addition to our state-of-the-art <i>in vivo</i> animal models of ARDS, we have established an <i>in vitro</i> model of alveolar epithelial monolayers co-cultured with macrophages to investigate whether cyclic strain not only promotes inflammation, but also inhibits the resolution of inflammation by reprogramming alveolar cells and whether MΦ are affected directly or by signals derived from alveolar epithelial cells. This is an interdisciplinary project, in which biologists and biochemists work closely together with biophysicists to investigate a clinically relevant topic. We greatly value teamwork and strive for excellent supervision. Your tasks You will be part of the vibrant DFG-funded graduate school Mechanobiology in Epithelial 3D Tissue Constructs and work at the internationally renowned University Hospital of RWTH Aachen (UKA). You will study the interaction of macrophages and the alveolar epithelium under cyclic mechanical strain, and of high and low strain amplitudes to mimic different inflammatory mechanical ventilation regimes. You will analyze cellular adaptation to strain on cytoskeletal components, the molecular inflammatory response and macrophage polarization (M1/M2) by using high resolution immunofluorescence imaging, qRT-PCR, ELISA, flow cytometry and further methods. Additionally, you will identify early markers for cell adaptation, by genome sequencing techniques with subsequent <i>in silico</i> analyses, and correlate these with the inflammatory response. You must be accepted as a Dr. rer. nat. candidate at the Faculty of Sciences of RWTH Aachen University.
Requirements / Your profile:	Your profile You have completed your studies in biology or biotechnology very successfully with a M-Sc. degree. You are committed to science, highly interested in medically relevant questions and have comprehensive expertise in the fields of cell and molecular biology. You should have broad experience in standard techniques such as PCR, antibody-based detection methods, light microscopy and cell culture. Now, you search for a highly relevant transdisciplinary PhD project, and you are highly motivated to work in a vivid scientific environment. You distinguish yourself by endurance, self-reliance and an excellent capacity for teamwork. You are fluent in written and spoken English.
Pay category:	TV-L 13 (65 %)
Hiring date:	July 2025
Duration of employment:	3 years
Contact/Send application to:	Dr. rer. nat. Kathleen Reiss Email: k.reiss@ukaachen.de, phone: +49 (0)241 80 89126 www.pharmakologie-toxologie.ukaachen.de
Equal career prospects for women and men.	
Severely disabled applicants with equal qualification will be given preferential consideration.	
Application deadline: March 03, 2025	