

The **International Research School “Lung Biology and Disease”** in the field of translational pulmonary medicine is offering

Full-time PhD Positions

The Comprehensive Pneumology Center (CPC), a translational research center dedicated to pulmonary medicine, was founded by three partners: The Helmholtz Zentrum München – German Research Center for Environmental Health, an expert in bridging fundamental experimental research with applied medical research, the Ludwig-Maximilians-Universität (LMU) with the University Hospital, one of the Top-Level-Universities in the German Excellence Initiative, and the Asklepios Fachkliniken München-Gauting, one of the leading hospitals specialized on lung disease in Germany.

The International Research School “Lung Biology and Disease” is the premier educational platform at the CPC and is now seeking highly qualified and motivated candidates for the following topics:

Project A: Development of *in vitro* approaches for research on mechanisms of lung regeneration

Supervisor: PD Dr. Claudia Staab-Weijnitz

Our knowledge about lung regeneration so far stems largely from studies in the mouse, where initial acute injury of the respiratory epithelium is induced by exposition to chemicals. These mouse models are associated with substantial distress and suffering for the animal. Furthermore, the cellular composition of the upper respiratory epithelium differs considerably between mice and men. Therefore, the objective of this Ph.D. project is to develop *in vitro* methods for the analysis of lung injury and regeneration in a human cell-derived organotypic system as an alternative to animal experimentation.

Project B: Validation of novel drug therapeutic strategies for lung fibrosis *in vivo*

Supervisor: PD Dr. Claudia Staab-Weijnitz

Idiopathic pulmonary fibrosis (IPF) is a devastating disease with few treatment options and a poor prognosis. Based on *in vitro* experiments and patient samples, we have identified the protein FKBP10 as a promising drug target for IPF. The objective of this Ph.D. project is to devise and evaluate novel therapeutic approaches for lung fibrosis in an *in vivo* approach, including the use of a conditional Fkbp10 knockout system.

Project C: Lung bioengineering: Rebuilding lungs as a future alternative for transplantation

Supervisors: Prof. Dr. Dr. Melanie Königshoff, Dr. Gerald Burgstaller

The aim of this project is to understand how reseeded stem cells (iPS and endogenous lung progenitor cells) are behaving in a decellularized lung scaffold, how they differentiate into lung cell phenotypes and how differentiated cells find their native niche in the extracellular matrix. For that, the project makes use of human lung tissue in combination with top-notch technologies, such as material engineering, advanced live imaging (confocal, lightsheet and 2-photon), single-cell RNAseq, and proteomic approaches.

Project D: Aging alveolar epithelial cells and their contribution to lung disease

Supervisors: Prof. Dr. Dr. Melanie Königshoff, Dr. Mareike Lehmann

Idiopathic pulmonary fibrosis (IPF) is a devastating lung disease with only limited treatment options. The incidence of IPF increases with age and accumulating evidence strongly suggests aging as a crucial driver of IPF. Alveolar epithelial cells are important cells for lung function and their

dysfunction has been proposed as one driver of IPF development. This project aims to investigate the aged alveolar epithelial cells and their contribution to disease development. Primary mouse and human alveolar epithelial cell isolations, molecular biology, single-cell RNA seq, and preclinical *ex vivo* models will be used to determine the phenotypes of aged epithelial cells.

Project E: Virus infections as risk factors in the development of bronchopulmonary dysplasia (BPD)

Supervisor: Prof. Dr. Heiko Adler

Neonatal chronic lung disease (nCLD), also known as BPD, is the most common complication in preterm infants and has long-term health consequences. In this project, we use new *in vitro* and pre-clinical *in vivo* models to investigate how viral infections determine the development of BPD in short and long-term studies.

Project F: Nanotoxicology in human bronchial epithelial cells

Supervisors: PD Dr. Anne Hilgendorff, Dr. Tobias Stöger

Understanding the interaction of inhaled nanomaterials with the respiratory system and individuals with chronic/inflammatory lung disease is critical to prevent or treat exposure related health effects in the future. We will utilize human cell-based assays to determine nanoparticle-induced immunomodulatory effects in primary epithelial cells from healthy and COPD patients. Cells will be exposed to engineered and environmental nanoparticles in an established realistic air liquid interface cell exposure system and particle-induced immunostimulation will be monitored at the cellular and molecular level. Data from patients and epidemiological cohorts will be used to translate findings into subjects exposed to air pollution in daily life.

Project G: Regulation of proteasome activators in lung biology and disease

Supervisor: Prof. Dr. Silke Meiners

Regulation of proteasome function via proteasome regulators emerges as a new concept in cell biology and disease. The cellular function of this super-complex formation is not understood. The objective of this Ph.D project is to develop reporter cells and mice to monitor endogenous regulation of the proteasome activator PA200 in the cell and its dysregulation in lung diseases using CRISPR/Cas-mediated engineering and FRET-based technologies.

The program is highly selective and invites applicants with a master's degree (or equivalent) in any field of the life sciences or medicine to commit to a career in translational medical research.

If you are interested in a doctoral position at the CPC, we invite you to send us your **application**, including the following documents (as a single pdf file):

- ✓ CV (max. 2 pages, in English)
- ✓ Motivation letter (in English, approximately one page) indicating your particular qualification and motivation for MD, MD/PhD or PhD studies and summarizing your research interests, ideas, and expectations regarding your future professional career.
- ✓ Proof of a master's degree or a first professional qualification degree from a university. German applicants - or foreign applicants who studied at German universities - without a master's degree, have to provide evidence of completion of a Diploma or "Staatsexamen" in the above-mentioned disciplines.
- ✓ Two letters of recommendation from instructors, advisors, or any other person qualified to evaluate your academic performance and potential for graduate training.

- ✓ Information or certificates about English language skills, if your mother tongue is not English. Good knowledge of the English language is necessary for successful completion of the program. Desirable is: a) An internationally recognized examination in English, b) a degree of an English-speaking school or university, or c) a longer stay abroad.

Please submit your application via the online platform: <https://www.helmholtz-muenchen.de/karriere/offene-stellen>

Closing date: **May 15, 2018**

Please contact Dr. Doreen Franke (research-school@cpc-munich.org) if you have any questions.