PhD Student / Lung Regeneration / Epithelial Lining Fluid Proteins

HelmholtzZentrum münchen
German Research Center for Environmental Health

CPC Comprehensive Pneumology Center

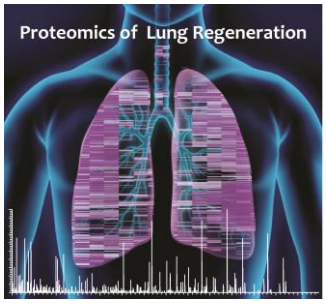
The Helmholtz Zentrum München (HMGU; https://www.helmholtz-muenchen.de) - a research institution within the Helmholtz Association of German Research Centers, is a leading center in health research with a focus on Environmental Health. The Comprehensive Pneumology Center (CPC, www.cpc-munich.org) at HMGU is a translational research center dedicated to respiratory medicine, which is also a partner site of the German Center for Lung Research (DZL; www.dzl.de), an association of the leading university and non-university institutions dedicated to lung research in Germany. Using translational research methods, the CPC seeks to develop new approaches for the prevention, diagnosis and therapy of chronic lung diseases, most importantly chronic obstructive pulmonary disease (COPD), diffuse parenchymal lung disease (DPLD), endstage lung disease, or lung cancer.

The Research Group "Systems Medicine of the Extracellular Niche in Chronic Lung Diseases", established within the HMGU as part of CPC and DZL from October 2015, focuses on mechanisms of tissue regeneration and the role of cell-matrix adhesions in stem cell differentiation (see references below[1-4]). In particular, the group uses and develops quantitative mass spectrometry methods to characterize the compositional changes and the molecular interactions within the pulmonary extracellular niche (e.g. epithelial lining fluid and basement membrane) and their impact on the dynamics of cellular signaling pathways.

1. Schiller, H.B. et al. Time- and compartment-resolved proteome profiling of the extracellular niche in lung injury and repair. *Molecular systems biology* **11**, 819 (2015).
2. Schiller, H.B. et al. beta1- and alphav-class integrins cooperate to regulate myosin II during rigidity sensing of fibronectin-based microenvironments. *Nature cell biology* **15**, 625-636 (2013).
3. Schiller, H.B. & Fassler, R. Mechanosensitivity and compositional dynamics of cell-matrix adhesions. *EMBO reports* **14**, 509-519 (2013).
4. Schiller, H.B., Friedel, C.C., Boulegue, C. & Fassler, R. Quantitative proteomics of the integrin adhesome show a myosin II-dependent recruitment of LIM domain proteins. *EMBO reports* **12**, 259-266 (2011).

For this purpose HMGU offers a position at the earliest possible date for a

PhD Student - Keywords: *Epithelial Lining Fluid, Protein Biochemistry, Pre-clinical Target Validation, Epithelial Homeostasis and Differentiation, Bronchioalveolar lavage, Clinical Proteomics, Secretomics*



Job description: Your project will aim at the functional characterization of epithelial lining fluid (ELF) proteins in maintenance of epithelial homeostasis and injury repair. The airway lumen is covered by the ELF into which epithelial cells and alveolar macrophages secrete proteins and peptides with a multitude of functions, including innate immunity, mucociliary clearance, and antioxidant defense. We recently characterized dynamic changes in ELF along a tissue repair progression timeline in the bleomycin induced lung injury mouse model (Schiller et al., 2015). The ELF of diseased human lungs may harbor a disease and progression specific combination

of secreted proteins and can be sampled from lungs using bronchoalveolar lavage (BAL), which is also a frequently used clinical procedure for diagnosis and monitoring of chronic lung diseases. We screened human ELF from insterstitial lung disease patients (unpublished) and identified markers of tissue repair in patients. In the course of your PhD project you will be involved in pre-clinical target validation of our candidate proteins with putative functions in tissue regeneration and homeostasis.

Your qualifications: We are looking for a curious, independent and creative person with a strong background and interest in protein biochemistry. You should hold a university degree in biochemistry, biology or an equivalent field and have good skills in state of the art molecular biology (e.g. cloning, CRISPR, qPCR) and biochemistry methods (e.g. protein and peptide fractionation, protein purification) and basic knowledge in coding (e.g. R, Matlab) and statistical data analysis. Skills or experience with animal or in vitro models of human disease are not mandatory but an advantage.

Our Offer: We offer you working in a young creative team in an innovative, well- equipped and scientifically stimulating surrounding with a variety of training opportunities (including mass spectrometry based systems biology. As a PhD student at CPC you will be part of the Research School „Lung Biology and Disease“, which is an international, interdisciplinary and thematically focused doctoral training program. Over a period of 3 years, students benefit from comprehensive teaching curricula and close mentorship while performing cutting edge research projects within one of the CPC research groups.

We look forward to receiving your application containing a CV, list of publications, a letter of motivation, as well as names and phone number to two referees via e-mail.

Please send your application to:

Dr. Doreen Franke
Research School Coordinator

Comprehensive Pneumology Center (CPC)
Ludwig-Maximilians-Universität, Asklepios Fachkliniken München-Gauting und Helmholtz Zentrum München
Max-Lebsche-Platz 31
81377 München, Germany

Phone: +49 89 3187-1689
Email: doreen.franke@helmholtz-muenchen.de
Web: http://www.cpc-researchschool.org, http://www.helmholtz-muenchen.de/ilbd