

MASTER THESIS PROJECT - Schiller lab @ HMGU

'Establish Multi-omics single cell analysis of mouse and human lungs (CITE-seq)'

(1) Antibody barcoding



(2) Cell staining



(3) Dropseq

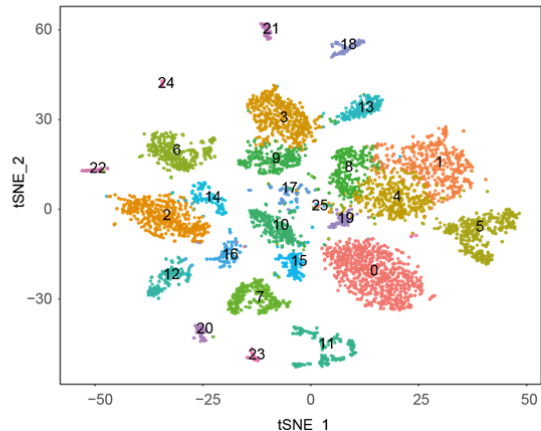
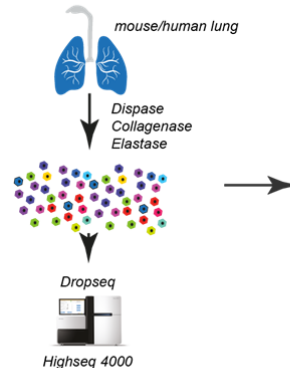
(4) mRNA AND protein quantification in single cells

Training (A):

- Tissue dissociation methods
- Magnetic cell sorting & flow cytometry
- High throughput droplet based microfluidics
- Antibody labeling with DNA barcodes
- scRNAseq / CITE-seq

Training (B):

- Next gen sequencing data processing
- R-Bioconductor based data analysis
- Statistics and bioinformatics



A **master thesis project** is available in the **Schiller lab** at **Helmholtz Zentrum München (Site: Großhadern)** from October 2018. We are looking for open minded, highly motivated individuals who are interested in understanding fundamental molecular and cellular principles of organ regeneration and fibrosis. The position will be funded with a competitive salary.

The project: Over 40 different potentially unique cell types with specific functions have been described in the lung. Single cell mRNA sequencing (scRNA-seq) of cells isolated freshly from their tissue context is revolutionizing systems biology studies of dynamic multicellular processes *in vivo*. We employ the recently developed Drop-seq method, which uses microfluidics to capture single cells along with sets of uniquely barcoded primer beads into nanoliter-sized aqueous droplets. Recent progress in combining this method with DNA oligo labeled antibody stainings enables single cell multi-omics analysis of both protein and mRNA. The master student will establish DNA barcoding of antibodies according to published protocols and start experiments with a panel of antibodies to characterize new cell populations in mouse and human lungs.

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.

We look forward to receiving your application containing a CV and a letter of motivation via e-mail to herbert.schiller@helmholtz-muenchen.de