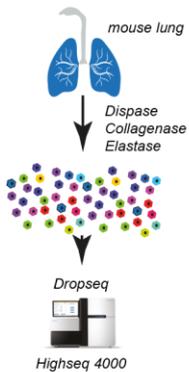


## MASTER THESIS PROJECT - 'Dissecting mesenchymal cell heterogeneity in the lung using single cell RNA sequencing and in situ hybridization imaging'

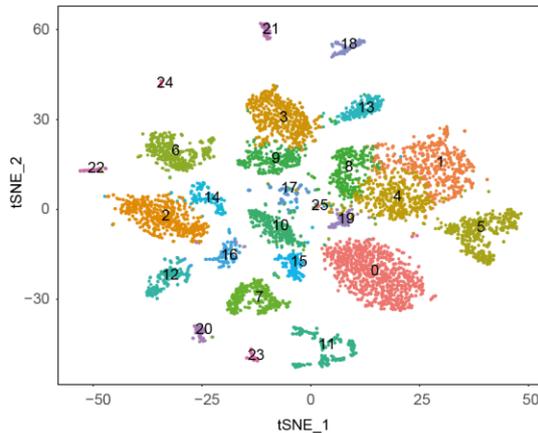
### Training (A):

- Tissue dissociation methods
- Magnetic cell sorting & flow cytometry
- High throughput droplet based microfluidics
- scRNAseq



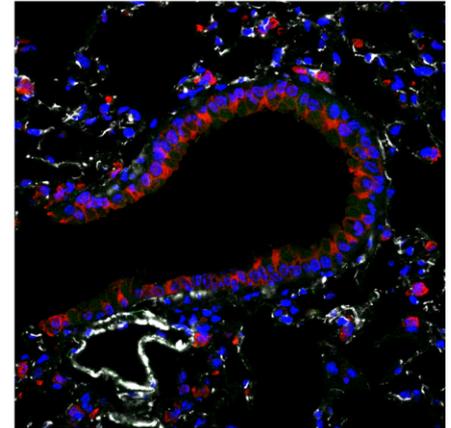
### Training (B):

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



### Training (C):

- Immunofluorescence & confocal imaging
- Multiplexed in situ hybridization technique
- 3D image reconstruction



A **master thesis project** is available in the **Schiller lab** at **Helmholtz Zentrum München (Site: Großhadern)** from March 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. The smart barcoding approach in Drop-seq allows the massively parallel, and thus cost-effective, analysis of mRNA transcripts from thousands of individual cells simultaneously while remembering transcripts' cell of origin. Using this workflow we have identified several poorly characterized mesenchymal cell types in mouse and human lungs and now wish to better understand their function in health and disease. The master student will establish magnetic bead sorting protocols and perform dropseq experiments. Furthermore, the cell types of interest will be analyzed using advanced imaging methods, including a novel multiplexed in situ hybridization technique.

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](http://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](http://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](mailto:herbert.schiller@helmholtz-muenchen.de)