

Title: Functions of novel dendritic cells in asthma (NCN/OPUS LAP).

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Laboratory: Laboratory of Cellular Genomics

www: <https://olab.com.pl/>

<https://shorturl.at/JNT69>

Project description:

Dendritic cells are critical immune sentinel cells that initiate and drive specific immune responses. While they are important for the induction of protective adaptive immunity against pathogens, they also play a key role in mediating aberrant inflammation, including in allergic diseases. Indeed, due to their ability to promote tolerance to innocuous antigens, they are key players in shaping if and how the organism will respond to allergens and thus play an essential role in allergic diseases such as asthma.

Dendritic cells consist of a heterogeneous group of cell subsets with distinct and overlapping functions which remain not fully understood. Furthermore, how this diversity of dendritic cells is impacted by asthma and how this in turn may drive detrimental lung inflammation remains unknown. In this project, we aim to determine the identity, tissue localization, transcriptional regulators and function of lung DCs, with a focus on their role in asthma. This project will be executed in close collaboration with laboratory of Prof. Samuel Nobs from IRB in Bellinzona, Switzerland.

Aim:

The overarching aim of this project is to investigate what are the subtypes of dendritic cells in the lung, identify their distinct functions and what role they play in asthma, with a goal in mind to identify potential treatment avenues and druggable candidates.

There will be two paths for the prospective PhD student: (wet) performing experiments on dendritic cells from the lung in healthy and asthmatic mice, which entails mostly single cell genomics and immunological assays and (dry) analysis of the multiomics data to identify subsets of dendritic cells and to predict their functions.

Requirements:

- Master's or Master's Eng degree in biology, biotechnology, engineering, computer science, mathematics, physics or related fields
- Strong interest in immunology and genomics
- Proficiency in written and spoken English
- Excellent interpersonal skills, initiative, good work organization, good collaboration skills
- Prior experience in following techniques will be an advantage (but not a prerequisite):
 - sequencing libraries generation (Illumina, single-cell genomics, RNAseq, ATACseq, ChIPseq, CUT&Tag)
 - FACS, cell sorting
 - working with mice (handling, injections, oral gavage, dissection, perfusion)
 - ability to code in R and/or Python and experience in data science
 - sequencing data analysis, multiomic data analysis

Number of positions available: 1

Contact: akolodziejczyk@iimcb.gov.pl Practical tips on how to prepare your application: <https://olab.com.pl/join-us/>