

Elective course track „Immunology in Research and Clinics“

Laboratory Course “Experimental Methods in Immunometabolism” (LSF#286044)

Dates:	1. Apr 2019 till 9. Apr 2019
Time:	daily from 9.00 AM – 12.45 PM and 1.45 PM – 4.30 PM
Location:	INF 350, Room 01.101
Instructors:	Dr. Margarida Souto-Carneiro, Prof. Dr. Yvonne Samstag
Participants:	12
Preparatory meeting:	23. Oct 2018 at 3.00 PM, INF 305, SR 208

Summary

During the laboratory sessions the participants will learn different experimental approaches to determine and quantify metabolic changes in immune cells and how to correlate such changes to their “classical” immune functions (e.g. cytokine production). Additionally, metabolic remodeling leading to functional changes in the immune response will be studied by using metabolic inhibitors and hypoxia induction. Participants will be trained in isolation of immune cells and in culturing them with isotopically labeled Glucose and Glutamine. Furthermore, multi-color flow-cytometry will be used to evaluate metabolic enzyme expression, mitochondrial potential changes, glucose uptake and lipid content in different immune cell subsets. Finally, ¹H nuclear magnetic resonance (NMR) spectroscopy to assess the differences and changes in metabolic pathways.

Time Schedule

Dates		Topics
Mon	01.04.2019	Isolation of CD4/CD8 T cells from human peripheral blood, and in vitro culture
Tue	02.04.2019	Addition of metabolic inhibitors to the cell cultures; preparation of PBMCs for glucose uptake, mitochondrial potential and lipid synthesis quantification; FACS quantification of glucose uptake and mitochondrial potential
Wed	03.04.2019	FACS quantification of lipid synthesis
Thu	04.04.2019	Staining and FACS analysis of metabolic enzyme expression on the CD4 and CD8 T cell cultures
Fri	05.04.2019	Quantification of cytokines in cell culture supernatants by cytometric bead array
Mon	08.04.2019	Quantification of metabolites in cell culture supernatants by ¹ H NMR
Tue	09.04.2019	Data analysis and interpretation