

## **Master of Science Thesis Position in Immunology of the maternal-fetal interface (placental) during pregnancy**

**Duration:** 9-12 months with a flexible start date

**Location:** laboratory of Prof. Dr. Melanie Greter, Institute of Experimental Immunology, University Zurich

**Supervisor:** Elsa ROUSSEL

### **Research Topic: Investigating the origin and role of fetal placental macrophages during pregnancy in mice and humans**

Pregnancy is associated with important immunological and metabolic changes that establish a tolerogenic environment enabling the genetically foreign fetus to grow. A successful pregnancy relies on a well-functioning placenta. The placenta is a transient organ of fetal origin and constitutes the direct interface between the fetal and the maternal milieu. It mediates oxygen and nutrient exchange to enable optimal fetal growth and is the first line of defense upon infections.

Understanding the immunological roles of the placenta is therefore key to finding new therapeutic interventions for pregnancy disorders and avoid developmental disorders due to poor placental function. Macrophages are part of the innate immune system and arise very early during embryogenesis. In human and murine placentae, macrophages represent the most abundant immune cell population. Our lab investigates the phenotype, heterogeneity and function of fetal placental macrophages. Using *in vivo* tools to transgenically manipulate fetal macrophages, we will investigate their roles for placental tissue integrity and function as well as for embryonic development. We will also phenotypically characterize human macrophages in placentae from healthy or complicated pregnancies.

### **Project aims:**

- Characterization of the different fetal macrophage subsets in terms of location and interaction with stromal cells in placental tissue in mice and humans.
- Determine the role of the different subsets during healthy or complicated pregnancies (infection)

**Techniques:** spectral flow cytometry, immunofluorescence, analysis of histological sections, bio-informatic analysis of flow cytometry data using R and FlowJo, ELISA, qPCR, ultrasonographic measurements.

### **We offer:**

- Exciting research project addressing relevant questions in the field of pregnancy and developmental research by making use of cutting-edge research technologies.
- Supportive environment with regular meetings
- Training on a vast array of research relevant techniques ranging from immunology, molecular biology and mouse physiology.

### **Requirements:**

- High motivation and curiosity about the research topic