

## Master thesis in the field of Translational Medicine and Microsystem Engineering

### Establishment of an iPSC cell system to generate hematopoietic precursor cells by using microfluidic chip technologies

The goal of this project is optimize and characterize a 3D tissue culture on a microfluidic chip to differentiate patient specific induced pluripotent stem cells (iPSCs) to generate hematopoietic progenitor cells (HPCs) for further differentiation into T cells.

#### **What will you do:**

You will generate and learn how to produce 3D tissue cultures with the goal of differentiating iPSCs into HPCs and further into T cells. In parallel you will be trained to set up a new microfluidic chip platform for automation of the culturing and differentiation process. For downstream analysis of the differentiation process you will use high-throughput FACS sorting, learn to apply cell population analysis, and develop new immunofluorescence assays compatible with the microfluidic chip platform.

#### **What will you learn:**

You will learn to work in a multidisciplinary environment with biologists and biophysicists in the labs of Prof. T. Cathomen and Dr. M. Meier. Further, building microfluidic large-scale integration chips based on PDMS, operation of the chips next to controlling the cell culture processes on chip, standard iPSC culture and modification technologies including embryoid bodies formation and iPSC differentiation and characterization. Further, we will teach you the analysis of thousands of data points.

Student will be hired on HiWi contracts at the IMTEK.

#### **Who to talk to:**

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