

Designing and Testing a 3D-Printed Fluidic Unit for In-vivo-like Cell Cultures

Description

For gut cell cultures in infection studies to be representative, there is the wish to mimic the biomechanical in-vivo conditions of the cells.

Epithelial gut cells in a living body are permanently stimulated by fluid-flow-induced shear stress and mechanical strain. The aim of this student work is to develop a 3D-printed system that adds shear flow to a cell stretching device designed to perform infection studies on cells with in-vivo-like biomechanical conditions. The flow unit needs to establish a homogenous velocity field over the cell culture area.

You will:

- Gain knowledge about state-of-art implementation of fluid flow in cell cultures and contribute to a recent interdisciplinary research project
- **Design and 3D-print** prototypes for fluid flow systems
- Perform flow measurements and **particle image velocimetry (PIV)** to evaluate the flow field of your prototype designs

You should:

- Be self-motivated, creative and able to work independently
- Have a background in engineering and fluid dynamics
- (Ideally be experienced in PIV)

Start: by arrangement
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