

Project 1.8 Development and optimization of a vasculature-on-a-chip approach to investigate endothelial cell response to proinflammatory agents

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www: <https://nencki.edu.pl/laboratories/laboratory-of-cellular-metabolism/>

Background:

An in vitro three-dimensional model of endothelium may be an alternative for animal models that helps to more effectively remodelling and predicting human biology and disease development. It satisfactorily helps to maintain specific interactions between cells, dynamic conditions typical for blood flow, and a proper extracellular environment typical for living tissues, all not reproducible in two-dimensional culture. Flow microsystems in which structures resembling blood vessels, Vasculature-on-a-Chip (VoC) systems can be used to understand how microvessels networks are formed and how they respond to various external stimuli (e.g., biological, chemical, mechanical). Organ-on a-Chip (OoC) that mimic tissues or organs with a network of microvessels create broad opportunities for studying cell-to-cell interactions in reliable in vitro models.

Aim:

Optimization of a VoC approach that allows us to analyse endothelial cell response to pro-inflammatory stimuli in 3D models in conditions resembling physiological /pathological circumstances stimuli and define the particular role of mitochondria in these processes.

Requirements:

- a strong interest in biochemistry and cell biology;
- Master's degree in biology, biotechnology, biophysics, and other related fields;
- a good command of spoken and written English and an open mind and desire to develop are a must.