

Faculty of Engineering

Summer Research Program 2022-2023

Project Title: Title: On-chip chemical gradient generation for cell separation

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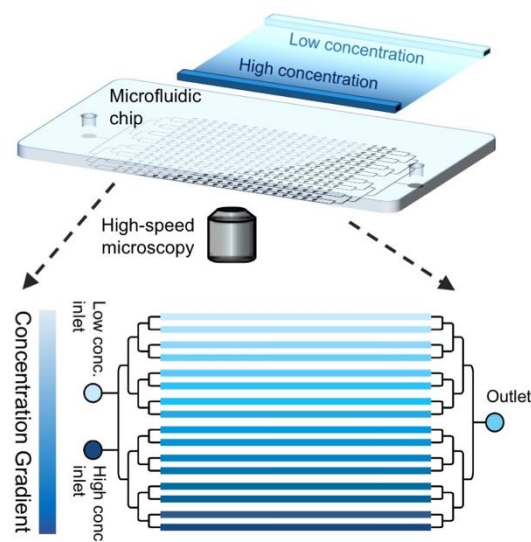
Website profile of project supervisor: <https://www.amblab.com/>

Objective

This project aims to develop a screening platform to carefully generate a gradient of chemoattractant on a microfluidic chip for fundamental and applied research into cell response to chemical concentrations and their migration behavior towards a chemoattractant.

Project Details

A network of branching microchannels at the inlet will be used as a concentration gradient generator to mix two source and sink streams of the chemoattractant chemical and produce a well-controlled and monitored concentration gradient across the microchannels. Computational modelling in COMSOL Multiphysics will be used to verify channel geometry and to ensure the functionality of the device for generating the concentration gradient. High-speed and high-resolution microscopy of selected microfluidic chambers in the device will be used to study cell response to chemoattractant concentration by quantifying cell migration behavior as a function of concentration and migration length.



Prerequisites

Background in fluid mechanics (MEC2404, CHE2161, TRC4802, MEC3451 or equivalent), and interest in fluid mechanics, experimentation, microscopy, and cell biology.

Additional Information

Applicants may be required to attend an interview, and for more information please contact Dr. Reza Nosrati (Reza.Nosrati@monash.edu).