

## Microfluidic bacterial wellness center

Microfluidic technology is a key technology by which we can precisely control, manipulate and monitor tiny volumes of liquid at the nanoliter and the picoliter scales, i.e. from one thousand to one million times less volume than the tiniest rain droplets you are typically capable to see (around one microliter).

These tiny droplets have a very well-controlled and safe environment due to being confined in such microfluidic chip of only a few millimeters. In this sense, microfluidic droplets are ideal to culture microbes under controlled and safe conditions.

In this master project we aim to create a microfluidic platform to culture the small swimming bacteria *Eschericia coli* within microdroplets.

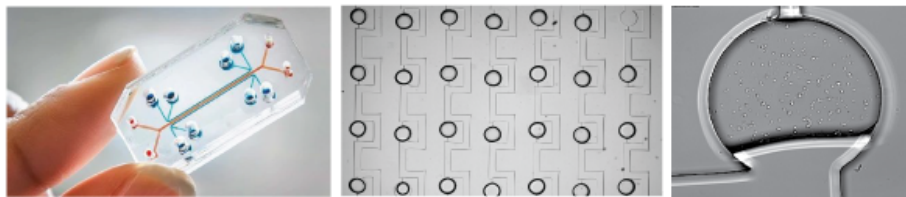


Figure 1: Left: Typical microfluidic chip (source: Darwin microfluidics). Center: Design for the microfluidic culturing region. Right: Single microfluidic droplet containing *E. coli* bacteria.

Your task in this assignment will be to cast these microfluidic channels and test them, first using colloidal particles to control the amount of particles per droplet, and eventually in the project with *e-coli* bacteria, in which the temperature control will be also important. We will make use of particle tracking techniques to make sure that the micro-organisms are feeling relaxed enough in this platform.

This project can be adapted as a Bachelor project, just testing the microfluidic platform and its temperature using colloidal particles instead of bacteria.

Supervision	Contact	Role
Alvaro Marin	a.marin@utwente.nl	(daily)Supervisor
Arturo Susarrey-Arce (MCS)	a.susarreyarce@utwente.nl	Co-supervisor

