Master Internship

Microfluidics for Algae Bacteria Interactions

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Place: ENS Paris-Saclay

Context

There is a huge potential of microalgae in various applications in food and feed industry, pharmaceutical, and cosmetics (Khanra *et al.*, 2018; Bhagea *et al.*, 2019). However, productivity and scaling up still are not at the level required for an economically viable industrial production. In particular, precise quantitative models of algal growth and production are missing.

Research questions

You will work with an interdisciplinary team to better quantitatively understand the growth of microalgae. Depending on your interests, you will work on one or several of the following questions:

1. Mathematical modeling of algal growth via chemical reaction networks. You will work on a new model with us.

2. Simulations and optimization of algal growth in computational models. You will work on Python code to simulate and optimize growth models.

3. Design of a microfluidic device to validate growth models. You will create a new chip to test and calibrate growth models at single-cell level.

4. Design of an experimental setup that tests the effect of bacteria co-cultured with microalgae. You will work in a team to plan and carry out an experiment to quantify the effect of bacteria on microalgae and vice versa if co-cultured.

Team

You will be part of an interdisciplinary research team at ENS Paris-Saclay, working on different aspects to improve algal production of components of interest such as lipids.

Required skills

Most important is a curious, driven attitude. An ideal candidate is inclined to mathematical analysis, coding (in Python), and interested to work with us in the wet-lab on an experimental setup.

You'd like to join?

Write a short statement of interest to us three: sakina.bensalem@ens-paris-saclay.fr, mfuegger@lsv.fr, and thomas@thomasnowak.net. If you have questions do not hesitate to contact us.