

Two Erasmus+ Internships in field of Microbiology and Bioprocess engineering

Academic year 2021/22 and 2022/23

About the project

Our society has to use natural resources more efficiently, as we are facing the challenges of plant pollution, fossil fuel depletion and increasing human population. To that end, the concept of circular bio-economy has been established, which aims at converting biological waste streams into bio-based products. This conversion can be carried out by microorganisms in a bioprocess where microbial cells self-arrange in a complex biofilm.

Recently, a new type of granular biofilm in fermentation system has been observed at Center for Microbial Ecology and Technology (<u>https://www.cmet.ugent.be/</u>), Ghent University. This biofilm has the potential to be used in a production of bio-based chemicals and bio-polymers from wastewater (Carvajal-Arroyo et al., 2019). Although the discovered biofilm shows great capacity for the future industrial application, little is known about its characteristics, the role of involved microorganisms and the impact of operational parameters on the bioprocess.

The overall objective of internship positions is to identify the main microorganisms involved in the granular biofilm formation and to understand how various environmental parameters influence biofilm properties.

Techniques and methods

Pure anaerobic cultures handling; working in anaerobic chamber; biofilm growth in batch and continuous systems (Modified Robbins Device); molecular methods (PCR, qPCR, agarose electrophoresis, Sanger and Illumina sequencing); single-cell technologies (microscopy, Flow cytometry, Raman spectroscopy), analytical methods (HPLC, GC, IC); etc.

General information

Supervisor: prof. dr. Ramon Ganigué

Tutor: Barbara Ulčar (https://www.linkedin.com/in/barbara-ulcar-cmet/)

Duration: 5 - 6 months, with some flexibility with the start and end date

- a) Academic year 2021/22: from the beginning of March until the end of August
- b) Academic year 2022/23: from the beginning of August until the end of December

If you are enthusiastic about this subject, willing to learn and open to new experience, please contact Barbara Ulčar (<u>barbara.ulcar@ugent.be</u>) by December 17th, 2021 the latest.

<u>Reference</u>

Carvajal-Arroyo, J.M.; Candry, P.; Andersen, S.J.; Props, R.; Seviour, T.; Ganigué, R.; Rabaey, K. *Granular fermentation enables high rate caproic acid production from solid-free thin stillage*. Green Chem. 2019, 21, 1330–1339