Living Lab Biobased Brazil
Education Research Innovation

Assignment internship Chemical Engineering or Environmental Engineering

Living Lab Biobased Brazil
The Living Lab Biobased Brazil is a transnational Living Lab in the field of Biobased Economy, created in 2014 by a consortium of Dutch Universities of Applied Sciences in collaboration with several Brazilian universities. The Living Lab helps students with internships and graduation projects in the Netherlands with the focus on Biobased Economy. We also help students finding accommodation, and offer buddy support and some events.

For more information please see www.biobasedbrazil.org and www.biobasedbrazil.org/student/the-netherlands/ or ask the International Office of your university.

University of Applied Sciences information:
The universities of applied sciences (in Dutch: 'hogescholen') offer programs that focus on the practical application of arts and sciences.

Getting practical work experience through internships is an important part of the professional study programs offered at these institutions. The largest universities of applied sciences enroll 20,000 to 40,000 students. Altogether some 446,000 students are enrolled on professional programs. University of Applied Sciences have also research groups. This groups do applied research and they are so called professorships. This internship assignment is within one of the associate professorships.

Avans University of Applied Sciences information:
Avans University of Applied Sciences was founded on 1 January 2004 following a merger of Hogeschool Brabant and Hogeschool 's-Hertogenbosch. At Avans University of Applied Sciences, around 29,000 students study 54 different courses. 2,400 employees work at 20 schools, 4 support units and 1 Learning and Innovation Centre.

Students, lecturers, professors and education professionals together form a lively network within our educational institution. Knowledge and competency development is the driving force and the connecting factor behind this.

Our varied and modern learning environment enables each student to develop his or her skills and ambitions to their maximum potential.

Our inspiring lecturers are experts in their fields and have a thorough knowledge of learning processes, enabling them to challenge students to push their boundaries and excel. The schools have structured their curricula, teaching and examinations based on our educational vision. We collaborate with a wide range of companies, professions and organizations as part of its teaching and research activities.

For more information please see the promotional YouTube video:
https://www.youtube.com/watch?v=5nsPBlE04Q4

Main research topic:
Optimization of green extraction of PHA.

General background:
PHA (polyhydroxyalkanoate) is a biodegradable bioplastic, that can be produced by PHA accumulating bacteria. Wastewater that contains volatile fatty acids (VFAs) or carbohydrates can be used as feed for a mixed culture of bacteria (sludge from a WWTP). These bacteria are capable of converting these VFAs or carbohydrates to the bioplastic PHA. PHA is accumulated and stored inside the bacteria in intracellular granules. Extraction of the PHA produced is the next step to obtain an usable bioplastic..

Goal of internship:
The aim of this project is to optimize a green extraction method of PHA. PHA needs first to be produced with a mixed bacterial culture on wastewater containing high concentrations of VFAs or carbohydrates. PHA inside the bacterial biomass will then be extracted with a green non-toxic solvent and its recovery will be compared with traditional solvents, like chloroform or DCM. PHA obtained from extraction will be analysed on its monomer composition with GC-MS and tested on its molecular weight and polydispersity with size exclusion chromatography (SEC).

Activities:
The Project involves:

- PHA accumulation experiments will be conducted in 2 litre bioreactors.
- GC-MS, TGA and SEC will be used in order to analyse the quantity and quality of the produced PHA.
- Extraction experiments will be conducted in order to find the optimized protocol for green extraction of PHA.

Final product
The student will write a report that contains an overview of all activities and findings.

Starting date
February 2019. The length of the assignment is approximately 5 months (20 weeks). The student who will execute the assignment get a fee of €550,- per month.

The intern will be part of a research team lead by the adviser and supervised by Profa. Michiel Michels.

Desirable skills/qualities of the student
The student should be able to carry out independent laboratory research. The preferred background is chemistry, chemical engineering or environmental engineering with interest in bioprocess engineering and analytical chemistry.

Good knowledge of the English language is required. We have set minimum language requirements for foreign students. The minimum English language prerequisite is: an academic IELTS test (or equivalent*) with an overall band score of at least 6.0. As a foreign student you must provide evidence of your language competences in the form of an official certificate: IELTS, TOEFL, TOEIC or Cambridge ESOL. It is your responsibility to ensure that you meet these requirements. **Please see the requirements on the webpage.**

Information of the company:

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Interested?

Please see the procedure at https://www.biobasedbrazil.org/student/the-netherlands/. Please be aware that the process stated at the above mentioned link applies.

PLEASE CONTACT FOR ADDITIONAL INFORMATION THE INTERNATIONAL OFFICE OF UFMG, UFV, UFSJ, UFOP OR PUC MINAS