Living Lab Biobased Brazil
Education Research Innovation

Assignment internship Organic Chemistry

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 several 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.

Obtaining 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. Universities of Applied Sciences also have research groups. These groups conduct applied research under the banner of so called professorships. This internship assignment is within one of the associate professorships.

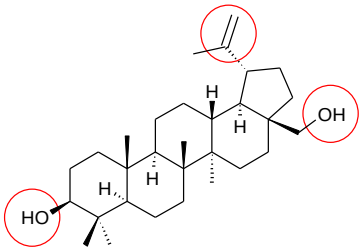
Hanze University of Applied Sciences information
The Hanze University is located in the north of the Netherlands, in the vibrant city of Groningen. Currently, approximately 28,000 students enjoy studying at the Hanze University in one of our 19 institutes and academies. One of these is the Institute for Life Science and Technology, in which the professorship of Biobased Chemistry is housed, led by Dr. André Heeres. Within this professorship, work is conducted on the (bio)chemical modifications of biomass. Biomass is diverse; from agricultural crops to (animal) residues. Two themes play an important role in research conducted within this professorship:

1. Modifications of biopolymers and monomers
2. Bioactive natural products and optimization towards medicinal drugs

The project offered here is concerned with the latter category.

Main research topic
The work that you will carry out is synthetic organic chemistry on several steroids.

General background
In a previous study, we have looked into the synthesis of lupeol from betulin. Both molecules have shown biological activity, but betulin is more widely available than lupeol. Betulin can be extracted from the bark of white birch, a common tree in the Netherlands, whereas lupeol is present in lupin beans, albeit in a very low concentration. This project is a continuation of the previous study. You will work on the syntheses of derivatives of both betulin (see below) and lupeol.



Much has been published about the biological activity of said derivatives and we seek to elaborate on these studies by aiming for potentially active components.

Goal of internship
The aim of the project is the syntheses of a number of betulin and/or lupeol derivatives that will be suitable for future bioactivity studies.

Activities
The project involves:

- Literature research in order to find suitable candidates
- Synthetic organic chemistry
- NMR/IR analyses (LC/GC-MS if necessary)

Final product
The student will write a report that contains an overview of all activities and results. Also, the student may be asked to present his or her results to an audience of peers.

Starting date
The internship starts at the beginning of February 2019. The length of the assignment is approximately 5 months (20 weeks). The student who will execute the assignment will be compensated with a fee of €250,- per month.

The intern will be part of a research team led by Dr. André Heeres and supervised by Dr. Patrick Uiterweerd.

Desirable skills/qualities of the student
The student should be able to carry out independent laboratory research. The preferred background is synthetic organic chemistry with sufficient knowledge of common analytical techniques, *i.e.* NMR, IR, LC-MS and GC-MS. Familiarising yourself with the 12 principles of green chemistry, as outlined by Paul Anastas and John Warner, is recommended.

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.**

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

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