

Master Internship Opportunity

Topic: Screening and Optimization of Hydrolysate Production from Invasive Aquatic Plants

Start Date: January 2025

Deadline: 13th December 2024

Background

Invasive water plants *Water Hyacinth*, *Egeria Densa*, and *Elodea Canadensis*, are among the fastest-growing plants known. Their rapid spread disrupts freshwater ecosystems, outcompetes native species, and hinders activities like fishing, navigation, and hydropower generation, costing governments in over 50 countries millions annually in control efforts, often leaving the biomass as unused waste. Despite this, these plant species hold immense potential in the bioeconomy as sustainable lignocellulosic feedstocks for microbial bioprocesses. With their low lignin content, these plants are ideal for mild pretreatment methods prior to hydrolysis. Hydrolysis is a critical process in making lignocellulosic biomass accessible for biotechnological applications such as the production of 2G biofuels and other biorenewables through microbial fermentation. This project focuses on assessing the variability of these feedstocks and developing process control strategies to produce high-quality hydrolysates for biofuel and biorenewable production.

Aim of the Internship

The internship will focus on optimizing a lab-scale hydrolysate production process using invasive aquatic plants. The objectives include:

1. **Literature Review:** Analyze existing methods for hydrolysate production and compare them with the current state of the art. This will involve comparing commercial hydrolytic enzymes with hydrolytic microorganisms.
2. **Experimental Screening:** Evaluate promising hydrolysis techniques on mildly pretreated aquatic plant feedstocks for use in the subsequent process.
3. **Performance Comparison:** Test the hydrolysates as cultivation media in *Saccharomyces cerevisiae* and *Pichia stipitis* fermentations (microtiter plates, Erlenmeyer flasks, and 2 L bioreactor scales).
4. **Process Integration:** Develop a standard operating procedure (SOP) to ensure reproducible hydrolysate production across batches.

Requirements

- Good organizational skills and independent planning of experiments.
- Proactive and detail-oriented work approach.
- Good laboratory skills.
- Basic fermentation experience.
- Familiarity with analytical methods.
- Team player with an open learning attitude.

Application Process

Please send your application documents, including a CV and cover letter, to **Eric Kariuki MSc.** (gathirwa.kariuki@tum.de). Feel free to reach out to him with any questions regarding this position.

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Take this opportunity to contribute to a sustainable future by transforming invasive aquatic plants into valuable biotechnological resources!

Privacy policy

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