FACULTY OF BIOSCIENCE ENGINEERING

The Chancellor of Ghent University has the honour of inviting you to attend the public defense of the doctoral dissertation of

ir. Way Cern Khor

Title of the doctoral dissertation:

Production of lactic acid and derivatives from grass using mixed populations

The public defence will take place on the **20th March 2017** at **4:00 pm** in the Aula Ceremoniezaal, Voldersstraat 9, 9000 Gent.

There will be a contiguous reception to which you are heartily invited.
Please confirm your attendance before **16th March 2017** to: waycern.khor@ugent.be or **0477 651 011**

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GHENT UNIVERSITY

Abstract of the doctoral research

Still think that grass is just food for horse, cows and sheep? Well, not for long! Grass can be found in almost every environmental niche on Earth and it contains complex carbohydrates, which can be converted into valuable chemicals by (bio)technological process. The potential of grass is still largely untapped due to several challenges including the inconsistent availability of grass, conversion of grass into chemicals, and their extraction.

In this research, we tackled these challenges by developing a process pipeline which converts grass into lactic acid. To improve the biodegradability of grass, pretreatments such as extrusion and calcium hydroxide pretreatment were performed, and the efficiencies were tested through biogas production. Next, a fermentation process using mixed microbial populations was carried out to produce higher value products such as lactic acid. From here, lactic acid can serve as an intermediate chemical to produce other compounds. Lactic acid was converted into caproic acid, and caproic acid was further converted into decane via Kolbe electrolysis. Decane has many uses, such as aviation fuel. Different extraction technologies for lactic acid were also tested to investigate the advantages and disadvantages for each technology. The research of each individual process unit gives a complete process pipeline for the grass biorefinery.

Brief Curriculum Vitae

Way Cern Khor was born in Penang (Malaysia) on February 17th, 1990. Way graduated with first class honours as Bachelor of Chemical Engineering at Newcastle University (The United Kingdom). From 2013, Way started working on a project funded by the Ghent University Special Research Fund at the Center for Microbial Ecology and Technology (CMET) in collaboration with research lab EnBiChem from the Department of Industrial Biological Sciences, Ghent University Campus Kortrijk, with research focused on the conversion of grass into valuable chemicals.

During his PhD research, Way guided two master students in their research projects and assisted the course work for “Microbial ecology and environmental sanitation.” He presented his work at several national and international conferences in Europe, the United States and Australia, and is currently (co-)author of four international peer reviewed publications.