

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

### **Xiaona Hu**

Title of the doctoral dissertation:

#### *Microbial protein production by autotrophic nitrogen-fixing hydrogen-oxidizing bacteria*

The public defense will take place on Monday the 12<sup>th</sup> of October 2020 at 16:00 via live-stream ([link](#)). Please select "Listen only" and do not share your video or screen. Questions can be asked via chat after the presentation.

#### **Dissertation supervisors**

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#### **Abstract of the doctoral research**

Food production will need to be increased in response to the growing world population and rising demand for high grade protein per capita. Due to the inefficient use of energy-intensive nitrogen fertilizers in contemporary agriculture and main nitrogen losses as manure during plant-livestock conversion, further expansion of traditional agricultural practices will exacerbate its environmental damage. Therefore, the interest in microbial protein produced by hydrogen-oxidizing bacteria has been renewed due to its potential to be integrated into food chain. However, the high demand of nitrogen fertilizers derived from the Haber-Bosch process remains environmentally stressful.

This thesis explored the potential of using autotrophic nitrogen-fixing hydrogen-oxidizing bacteria to produce microbial protein as an alternative to protein source from food and feed. An enriched microbial community was used to demonstrate the protein quality and yield of the proposed process. Then pure cultures were obtained from the community to study its microbial ecology. The possible roles and interactions of diverse isolates in the community were studied using genome comparison and synthetic communities.

The proposed process could produce high-quality protein with an energy conversion efficiency higher than that of soybean. Understanding of the microbial ecology of the enriched community will contribute to the microbial resource management for more efficient biomass production.

#### **Brief Curriculum Vitae**

Xiaona Hu is from Henan, China. She received her Bachelor's degree in Environmental Science in 2013, Zhengzhou, China. Then she moved to Shanghai and obtained her Master's degree in Environmental Engineering in 2016. She started her PhD research at the Center for Microbial Ecology and Technology (CMET) in 2016. Her doctoral research explored the potential and microbial ecology of nitrogen-fixing hydrogen-oxidizing bacteria to produce microbial protein as an alternative to protein in food or feed.

During her PhD, her research lead to several scientific articles in peer-reviewed journals. She had the pleasure to supervise two students during their Master research and mentor one PhD student.