

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

### **MSc. Caian He**

Title of the doctoral dissertation:

### ***Potential application of pectins, isolated dietary fibers from agro-industrial by-products, to encapsulate and protect probiotics***

The public defense will take place on 01/12/2021 at 16:00.

However, due to the strict government restrictions related to **COVID-19**, the public defense will be livestreamed. You can attend the defense through the following link:  
<https://www.fbw.ugent.be/doctorate/CaianHe>.

We kindly ask you to dial in 5 minutes before the defense, switch off your camera and mute your microphone to not disturb the candidate and jury members during the defense.

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

Food waste will cause not only an environmental concern but also lead to economic losses. To address this issue, recycling and utilization of the resources from agro-industrial by-products are considered important actions. Dietary fibers (DFs) abundantly present in agro-industrial by-products have high promise as a potential ingredient/additive in (functional) foods, but a comprehensive study on the valorization and application of DFs from agro-industrial by-products is still limited.

The overall aim of this PhD was to investigate the valorization of DFs from agro-industrial by-products and their potential application as physical carriers for probiotics (three Lactobacillus strains). In this PhD thesis, DF concentrates recovered from six different agro-industrial by-products were screened for their protective carriers for lactobacilli. Clementine peel was then selected and subjected to further isolate clementine peel pectins (CMPs) using a green extracting agent. The isolated CMPs were applied as physical carriers to protect lactobacilli upon heat shock, freeze-drying and simulated gastrointestinal digestion, of which the low-methoxyl CMPs were found to provide higher protective performances, especially in the form of pectinate microcapsules. These findings demonstrate that pectinate microcapsules are promising protective carriers for probiotics.

#### **Brief Curriculum Vitae**

Caian He was born in 1990, Guangxi, China. He obtained his Bachelor's degree in Food Science and Engineering at Northwest A&F University. In 2014 – 2017, he followed the Master in Agricultural Products Processing and Storage Engineering at Northwest A&F University. In his master thesis, he studied the topic: "The effects of interactions between Tartary buckwheat polyphenols and Tartary buckwheat starch on the physicochemical properties and *in vitro* digestibility of starch". In 2017, he obtained a PhD scholarship from the China Scholarship Council (CSC) funded by China for four years. He started his PhD at research unit VEG-i-TEC, UGent Campus Kortrijk. The main focus of the PhD is the valorization of dietary fiber concentrates from agro-industrial by-products and their application as probiotic carriers. During the PhD study, he has three papers published in peer-review international journals.