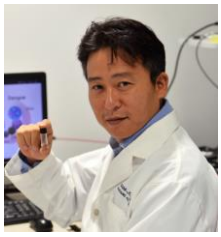
NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Materials Science and Engineering



Seminar Topic:
Translating Plant Pollen into Materials Science Technologies

Associate Professor Cho Nam-Joon

Abstract

The sporoderms of pollen grains and plant spores provide an ideal source of robust monodisperse capsules for microencapsulation applications. Indeed, plant-based sporoderms are nature's solution to protect sensitive genetic materials from harsh environmental conditions. They also offer a promising natural solution to the large-scale manufacturing of microcapsules. The outer sporoderm layer (exine) of the pollen grains and plant spores typically comprises a biopolymer, i.e. sporopollenin, which possesses remarkable physicochemical stability. The inner sporoderm layer (intine) is composed of a combination of cellulosic materials. In this talk, I will introduce the chemical processing strategies for extracting the sporoderm microcapsules as well as various techniques for the loading of macromolecular compounds into the as-prepared microcapsules. In vitro studies offer insight into the release profile of compounds from individual microcapsules as well as from other types of microcapsule assemblies. Further studies with enteric coencapsulation allowed for the development of a sporoderm microcapsule system for targeted intestinal delivery with tunable controlled release. Overall, our studies provide important insights into the ongoing exploration of these promising natural microcapsules and their potential for utilization in a wide range of biotechnology applications.

Biography

Dr Cho Nam-Joon is an Associate Professor in the School of Materials Science and Engineering at Nanyang Technological University, Singapore. He is also a Principal Investigator at the Singapore-MIT Alliance for Research and Technology. His research activities focus on creating biomaterial approaches to solve important biomedical problems and to translate these capabilities into practical applications for global health. Key research activities include natural biomaterials for microencapsulation applications, acoustic and optical biosensing platforms, and the development of membrane-active antimicrobial strategies. His research team has published over 170 scientific papers in top journals, such as *Nature Materials*, *Nature Medicine*, *Nature Communications*, *Nature Protocols*, *Science Translational Medicine*, *Science Advances*, *ACS Nano*, *Nano Letters*, and the *Journal of the American Chemical Society*. Dr Cho's scientific work has been highlighted by international media organizations, such as *The Straits Times*, *Reuters*, *CNBC* and *Businessweek*. This has led to licensed technologies in the fields of antiviral medicine and biotechnology. Dr Cho is a graduate of Stanford University and the University of California, Berkeley.

Wednesday, 7 November 2018 ǁ Time: 2:00 pm – 3:00 pm
Venue: MSE Meeting Room (N4.1-01-28)
Hosted by: Associate Professor Dong Zhili

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