

School of Materials Science and Engineering



Seminar Topic:
Extracellular Nanovesicles “Exosome mimetics”: from Eukaryotes to Prokaryotes Application

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Abstract

In Singapore, up to 50% of the hospital acquired infections are resistant to front-line antibiotic therapies. As the general antibiotic resistance constantly increases, bacterial vaccination is a potential strategy to solve this problem. Today, most of the vaccines are issued from inactivated bacteria or are directed against the bacterial capsule. A new method has recently being investigated is the vaccination that utilises extracellular membrane vesicles derived from bacteria. Similar to their eukaryotic counterparts called exosomes, bacterial extracellular vesicles (BEVs) are very difficult to isolate and therefore to characterize, render their study and therapeutic use are challenging.

Most studies on BEVs have in the past been focused on outer membrane vesicles (OMVs) that can be retrieved from Gram-negative bacteria possessing an outer membrane. But there is still a lack of vaccines for several Gram-positive bacteria and some of the current vaccines are not protecting again all the serotypes, therefore, novel vaccination approaches are needed.

We have recently developed a robust and inexpensive method for production, isolation and characterisation of exosomes mimetics from eukaryote cells. Based on this approach, we have produced bacterial extracellular vesicles mimetics (BEVMs) in large scale and used for the development of new vaccines targeting life-threatening bacterial infections. During the seminar, the production, characterisation and application of extracellular Nanovesicles from eukaryotic and prokaryotic cells will be discussed.

Biography

Dr Bertrand CZARNY received his PhD degree on Structural and Functional Engineering of Biomolecules at University of Paris Descartes. He joined the French governmental agency CEA (Atomic Energy Commission), then Utrecht University for more than 10 years studied the biodistribution, drug delivery systems and toxicology of nanoparticles. Dr Bertrand CZARNY is Assistant Professor at School of Materials Science and Engineering (MSE) and holds a joint appointment at Lee Kong Chian School of Medicine (LKC) in Nanyang Technological University, Singapore. His research is focused on the development of nanomedicines with large emphasis on exosomes mimetic and in vivo pre-clinical studies. His research is highly translational and is broadly applicable to many pathological conditions.

Wednesday, 28 August 2019 || Time: 2:00 pm – 3:00 pm
Venue: MSE Meeting Room (N4.1-01-28)
Hosted by: Professor Lam Yeng Ming