

Department of Biomedical Sciences
presents a seminar

“Chemical Biology Approaches for Biofilm Eradication”

Dr. Liang Yang

Singapore Centre for Environmental Life Sciences Engineering

Date : 11 May 2017

Time: 3:00pm to 4:30pm

Venue: Meeting Room 1B-G04, G/F, Block 1, To Yuen Building

Abstract

A bacterial biofilm is a surface attached community of microorganisms embedded in and protected by an extracellular matrix of self-made biomolecules. The US National Institute of Health (NIH) has estimated that 65-80% of all microbial infections involve bacterial biofilms. Biofilm-based bacteria can evade the otherwise detrimental actions of immune responses and develop into chronic infections. Because the present day's armory of conventional antimicrobials cannot efficiently eradicate biofilms, there is an urgent need to understand the fundamental mechanism of antibiotic resistance by biofilms. One major obstacle to study biofilm physiology is the heterogeneity in biofilms, which often confounds our efforts to target specific aspects of biofilm biology. Bis-(3'-5')-cyclic dimeric GMP (c-di-GMP) is a global, intracellular secondary messenger that controls biofilm differentiation. High intracellular levels of c-di-GMP stimulate bacteria to form biofilms by enhancing synthesis of adhesive structures and biofilm matrix components while low intracellular levels facilitate motility and chemotaxis. An advanced proteomics approach was developed, which uses pulsed stable isotope labeling with amino acids (pulsed-SILAC) to separate and systematically examine the antibiotic sensitive and resistant subpopulations from the same biofilm. This pulsed-SILAC technology is particular suitable for studying the killing efficacies of combinatorial, antibiotic treatments of biofilms and their dispersed cells.

About the Speaker

Dr. Liang Yang is the Deputy Research Director for the Public Health and Medical Biofilm Cluster of Singapore Centre for Environmental Life Sciences Engineering (SCElse). SCElse is one of the world's leading biofilm research institutes supported by the National Research Foundation and the Ministry of Education of Singapore under its Research Centre of Excellence Programme. Dr. Yang's research is dedicated to bacterial biofilm drug resistance, interspecies communications, adaptive evolution and host-pathogen interactions. Dr. Yang has published 80 plus peer-reviewed research articles with a total citation more than 4,000 times according to google scholar. Dr. Yang has been awarded the FEMS Congress Grant for Young Scientist, Alexander von Humboldt Research Fellowship and the Elite Nanyang Assistant Professorship. Dr. Yang serves as an editor board member of Applied and Environmental Microbiology and reviewers for many scientific research journals such as Environmental Microbiology, Molecular Systems Biology, Antimicrobial Agents and Chemotherapy, Medicinal Research Reviews, Journal of Antimicrobial Chemotherapy, Trends in Biotechnology and Journal of Biochemistry.

All are welcome !

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