



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY
Division of Life Science

Seminar

Metabolic Drivers in Longevity Regulation

by

Dr. Meng Carla WANG

Associate Professor

Department of Molecular and Human Genetics

Department of Molecular and Cellular Biology

Department of Neuroscience

Huffington Center on Aging,

Baylor College of Medicine, TX

Introduction

Metabolism is fundamental to life. During metabolic reactions, thousands of chemical intermediates and byproducts (metabolites) are generated. These metabolites are most directly connected with cellular activities and most conserved across species. In addition to their well-known functions as structural building blocks and energy sources, research in my group focuses on their signaling roles in orchestrating cellular and organismal homeostasis. We discovered two metabolite-directed communication systems: lysosome-to-nucleus signals and bacteria-to-mitochondria messages. Lysosomes are vital organelles for cellular health. Our works uncovered a metabolite communicating between the lysosome and the nucleus, and its associated lysosome-to-nucleus retrograde signaling pathway in regulating longevity. Based on symbiogenesis, eukaryotic mitochondria are ancient relatives of bacteria. Our work discovered that bacteria-secreted metabolites actively regulate mitochondrial dynamics to influence host longevity, and deciphered the underlying molecular mechanisms. These discoveries provide new insights into metabolite-directed signaling networks in cellular, organismal and interspecies communication, and promising nutraceutical targets for improving healthy aging. Technically, we applied stimulated Raman scattering microscopy for metabolite fingerprinting in living cells and organisms, revealing new regulatory mechanisms that govern spatiotemporal dynamics of lipid molecules under both physiological and pathological conditions.

Date : 20 February 2017 (Monday)

Time : 3:00 pm

Venue : Room 2304 (Lift No. 17-18)

Host : Prof Ho Yi MAK

All Are Welcome!