TEMS

Temasek External Monthly Seminar

TEMASEK LIFESCIENCES LABORATORY

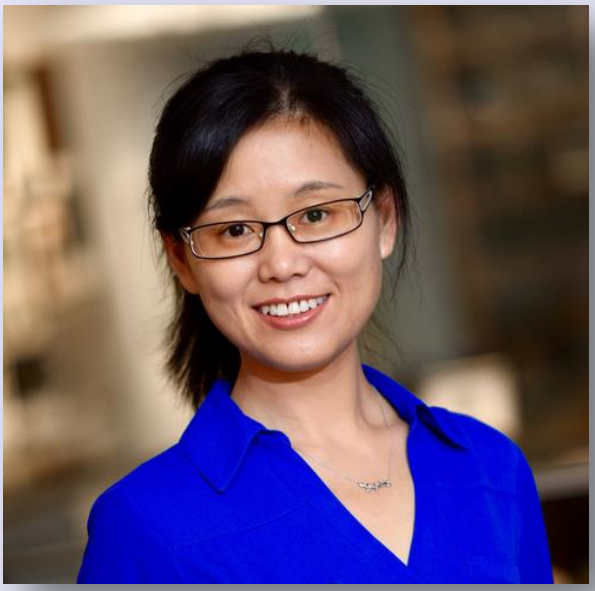
ALL ARE WELCOME

27 July 2018 (Friday), 3.00pm
The Auditorium (Level 1)

Hosted by: Dr Koh Tong-Wey

Metabolic Drivers in Longevity Regulation

Dr Meng WANG
Baylor College of Medicine, United States



Dr. Meng Wang is an HHMI investigator, Associate Professor and Robert C. Fyfe Endowed Chair on Aging at Baylor College of Medicine. She received B.S. from Peking University and Ph.D. from University of Rochester. She joined the faculty at Baylor in 2010. Her research focuses on molecular mechanisms governing aging, reproduction and metabolism and their interrelationship, through harnessing the power of functional genomics, metabolomics and optical biophysics.

Metabolism is fundamental to life. During metabolic reactions, thousands of chemical intermediates and byproducts (metabolites) are generated. These metabolites are directly connected with cellular activities and very 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 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.

Recent Publications:

1. Lin, C., **Wang, M.C.** (2017) Microbial Metabolites Regulate Host Lipid Metabolism through NR5A-Hedgehog signaling. *Nat Cell Biol* 19(5): 550-557
2. Bing, H., Sivaramakrishnan, P., Lin, C.J., Neve, I.A.A, Sowa, J.N., He, J., Tay, L.W.R., Sizovs, A., Du, G., Wang, J., Herman, C., **Wang, M.C.** (2017) Microbial genetic composition tunes host longevity. *Cell* 169(7): 1249-1262
3. Yu, Y., Mutlu, A.S., Liu, H., **Wang, M.C.** (2017) High-throughput screens using photo-highlighting discover BMP signaling in mitochondrial lipid oxidation. *Nat Commun* 8: 865