Institute of Molecular and Cell Biology
A*STAR

SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by Prof. Wanjin Hong:

Date: 11 July 2014, Friday
Time: 11:00AM – 12:00PM
Venue: Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Speaker: Prof. Tony Kong, Distinguished Professor and Glaxo Endowed Professor of Pharmaceutics, Rutgers, The State University of New Jersey, USA
Title: Diseases Preventive Mechanisms of Natural and TCM Products - from Nrf2-signaling, epigenetics/epigenomics to *in vivo* efficacy

Diverse dietary and TCM phytochemicals are capable of promoting human health and prevention of diseases including cancer. These phytochemical "antioxidants" can counteract oxidative stress which is caused by an imbalance of reactive oxygen species (ROS)/reactive nitrogen species (RNS) and the antioxidative stress defense systems in cells. ROS/RNS or carcinogen metabolites can attack intracellular proteins, lipids, and nucleic acids, which can result in epigenetics modifications, genetic mutations, carcinogenesis, and other diseases. Nrf2 plays a critical role in the regulation of many antioxidative stress/antioxidant and detoxification enzyme genes, such as glutathione S-transferases (GSTs), NAD(P)H:quinone oxidoreductase 1 (NQO1), UDP-glucuronyl transferases (UGTs), and heme oxygenase-1 (HO-1), directly via the antioxidant response element (ARE). Our lab study many different classes of dietary plant phytochemicals; phenolic-antioxidants, isothiocyanates, tocopherols, omega-3 fatty acids and herbal medicines, which are potentially effective against many disease models including cancers. These compounds modulate kinases, activate Nrf2-mediated antioxidative stress/anti-inflammatory pathways and induce cellular defense genes HO-1, GST, and NQO1. Integrating Nrf2-/- mice with microarray bioinformatics/systems biology, other gene pathways including apoptosis, cell adhesion, cell growth, kinases, electron transport, transcription factors, and ubiquitination, are also Nrf2's targets, leading to the overall cellular protective effects against oxidative/carcinogenic damages, particularly during carcinogenesis initiation. The Nrf2-/- mice are more prone to carcinogen-induced skin, colon and other cancers and are more susceptible to DSS-induced colon inflammation and DSS-AOM-induced colon carcinogenesis. Inhibition of LPS-induced inflammation in mouse macrophages by sulforaphane (SFN) would require Nrf2. Epigenetically, in the prostate TRAMP tumors, as cancer progresses, a shut-down of Nrf2 via CpG methylation of the promoter region, attenuating Nrf2-mediated genes, which were reversed by dietary curcumin, apigenin, SFN/PEITC, DIM, tocopherols, and herbal medicine *Radix angelica* sinensis/Z-ligustilide (Danggui 当归) & *Salvia miltiorrhiza*/tanshisone (Danshen 丹参). These phytochemicals demethylate CpGs of Nrf2 promoter in TRAMP C1 and JB6 cells and Neurog1 promoter in LNCaP cells by curcumin, which would impact early cancer initiation/promotion as well as later stages of cancer progression. In summary, dietary/TCM phytochemicals can confer early diseases (e.g. cancer) preventive epigenetic activities resulting in blocking initiation/promotion, as well as later stage of epigenetic modifications inhibiting progression of diseases including cancer. (Supported by NIH grants).

Biography:
Ah-Ng Tony Kong is Distinguished Professor, Glaxo Endowed Chair Professor of Pharmaceutics and Director of the Graduate Program in Pharmaceutical Sciences at Rutgers, The State University of New Jersey. He is also the Director for the Center for Quantitative Systems Biology & Pharmacology and the Leader of the Carcinogenesis and Cancer Prevention program at the Cancer Institute of New Jersey. Dr. Kong received his B.S. in Pharmacy from the University of Alberta, Canada and his Ph.D. in Pharmacokinetics and Pharmacodynamics from the State University of New York at Buffalo. He received his post-doctoral training in molecular genetics and cellular signaling at the National Institutes of Health (NIH). He was on the faculty of Thomas Jefferson University Medical School and the University of Illinois at Chicago before joining Rutgers in early 2001. Dr. Kong continues to serve on the NIH Study Section since 1999 and he has been continued receiving funding support from the NIH since 1993. He has trained more than 40 post-doctoral fellows, visiting professors, and Ph.D. students. He has published more than 200 original research, review articles and book-chapters. He has chaired and given presentations in many National and International Symposia. He teaches in Pharmacy and Pharmaceutical Sciences, Biopharmaceutics, Pharmacokinetics and Drug Metabolism to the PharmD and Ph.D./M.S. Students. He is the Editor-in-chief of *Current Pharmacological Reports*, Associate Editor of *Molecular Carcinogenesis, Life Sciences*, and member of editorial advisory boards of *Carcinogenesis, Biopharmaceutics and Drug Disposition and Cancer Prevention Research (AACR)*. His research focuses on epigenetics/epigenomics, dietary phytochemicals (signaling and gene expression, nutrigenomics, cancer chemoprevention), animal cancer models of prostate, colon and skin, oxidative/redox/inflammatory stress response and Nrf2-mediated nuclear transactivation & signaling, pharmacokinetics/ pharmacodynamics and PK-PD modeling of phytochemicals.

ALL ARE WELCOME *(No registration required)*