



## **Seminar Topic:**

# **Nano-bio Interaction: When Small Meets Smaller**

**by Assistant Professor Dalton Tay Chor Yong**

### **Abstract**

Understanding the cellular responses to engineered nanomaterials (ENMs) and establishing the materials structure-bioactivity relationship (SBR) are fundamental tenets of bio-nanomaterials science. It is well established that physicochemical properties such as material composition, size, surface charge, surface chemistries, shape, *inter alia*, are important determinants of nano-bio interactions. Depending on the site and time-scale of these nano-scale interactions, the associated biological responses can range from something that is deemed to be biologically inert to even a toxic outcome. However, in between the two ends of the continuum also lies a myriad of unexpected (and often neglected) ENMs induced biological responses (“bio-nuances”). Our lab is interested to understand and establish the design principles governing the innate bio-activity of ENMs. In this talk, I will detail the team’s recent effort to unravel these novel “bio-nuances” and signal-transduction events that are triggered by inorganic ENMs (e.g. Au, SiO<sub>2</sub>, ZnO, TiO<sub>2</sub>, etc). Special emphasis will be placed on the bio-effects of these ENMs on human endothelial and dermal cells, as well as, to discuss their potential biomedical exploitations

### **About the Speaker**

Dr. Dalton Tay received his B. Eng (1st Class Honors) and Ph.D. from the School of Materials Science and Engineering, Nanyang Technological University (NTU) in 2007 and 2012 respectively. His Ph.D. research focused on the development of novel micropatterned bio-polymeric surfaces to direct lineage specification of adult stem cells for regenerative medicine. In 2012, he joined the National University of Singapore (NUS) as a Lee Kuan Yew (LKY) postdoctoral fellow with the Department of Chemical and Biomolecular Engineering. During his post-doctoral tenure, he majored in the etiology of inorganic nanomaterials triggered biological responses within the framework of biosafety and nanotherapeutics. In addition, he has also developed several bio-inspired nano-micro biomaterials platform that could be applied for diagnostic and screening applications. He subsequently joined the School of Materials Science and Engineering and School of Biological Sciences (NTU) as an Assistant Professor in 2015.

**Wednesday, 25 October 2017 Time: 2:00 pm to 3:00 pm**

**Venue: MSE Meeting Room 1 (N4.1-01-28)**

**Hosted by: Assistant Professor Martial Duchamp**