

# SEMINAR - A/Prof. Kah Chan Yong, James, Monday, 4 September 2017

## SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by Prof. Takafumi Inoue and Dr. Madoka Suzuki:

**Date:** Monday, 4 September 2017

**Time:** 10:00AM - 11:00AM

**Venue:** 先端生命医科学センター(TWIns) 生命医科学科会議室  
(No registration required)

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**Speaker:** Kah Chen Yong, James, Ph.D., Assistant Professor

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**Title: Engineering Appropriate Nano-Bio Interface formed from Biomolecules to Enhance Biological Processes**

**Abstract:** The interaction between nanoparticles and functional biomolecules in biological media gives rise to the nano-bio interface which alters the surface characteristics of the nanoparticles and is what the biological system sees and interacts with. Intelligent design of this nano-bio interface can be used in many biomedical applications. Here, I will show some two examples of how we can engineer appropriate nano-bio interface formed from functional biomolecules such as DNA and proteins in the treatment of diseases. I will first demonstrate how we can exploit the non-specific absorption of proteins around nanoparticles to form the protein corona as a drug delivery vector for loading of multiple drugs to perform multimodal cancer therapy *in vitro* and also in small animals. I will also show how we can functionalize the surface of nanoparticles with DNA and use it as a scaffold for recruitment of cellular protein translation machineries through non-specific adsorption to enhance the translation of mRNA in cells as a potential treatment of diseases associated with protein deficiencies such as diabetes. The outcomes of our study show that it is possible to make use of this nano-bio interface to interact with biological systems for useful applications.



**Biography:** Dr. James Kah is currently an Assistant Professor in the Department of Biomedical Engineering in NUS. He received his B.Eng. with first class honours in Electrical Engineering and subsequently completed his Ph.D. in 2009, both from National University of Singapore (NUS). Prior to joining NUS in late 2012, James was a Postdoctoral Fellow in the Department of Biological Engineering at the Massachusetts Institute of Technology (MIT). He is currently the Principal Investigator of the Nanomedicine & Nanorobotics Laboratory at NUS. His current research interests focus on understanding the nano-bio interface and developing nanodevices with smart interface strategies to effectively probe and modulate biological processes for diagnostic and therapeutic applications particularly in cancer and infectious diseases.