

# RESEARCH SEMINAR

## September 2018

MON  
**17**  
SEP  
5 pm  
S4A L3  
Rooms  
A&B

## Engineering the Nano-Bio Interface to Enhance Disease Therapy



### Asst. Prof. James Chen Yong Kah

Department of Biomedical Engineering  
National University of Singapore  
4 Engineering Drive 3, Blk E4, #04-20  
Singapore 117583  
[biekahj@nus.edu.sg](mailto:biekahj@nus.edu.sg)

Hosted by A/Prof Rachel Ee

### Abstract

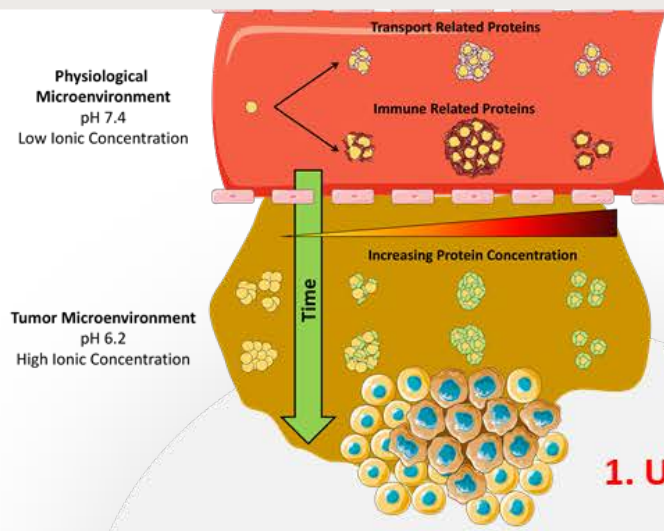
The nano-bio interface is key towards an effective nanomedicine since the interface confers the biological identity of any nanomaterials or nanostructures. Instead of developing new nanomaterials or nanostructures, we focus on the bioengineering of nanoscale interface to biology using model nanoparticles with the goal of enabling new capabilities in the diagnosis and treatment of cancer and infectious diseases. Here, I will first discuss our recent insights on the biological responses of the nano-bio interface,

particularly on their vascular behavior including margination and trans-endothelial migration in microvascular flow. I will then discuss two approaches we adopted to exploit the protein corona nano-bio interface in drug loading and in enhancing the translation of mRNA for modulating biological processes at the molecular and in vivo level. Our research in these areas highlights our contributions in providing a less chartered paradigm in exploiting the nano-bio interface beneficially.

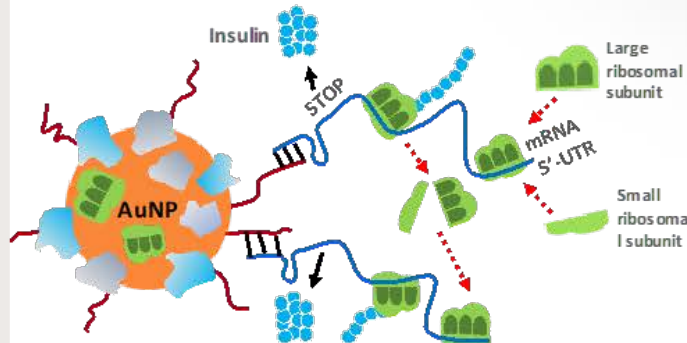
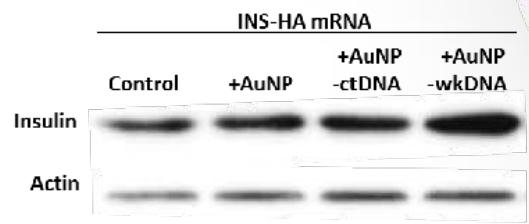
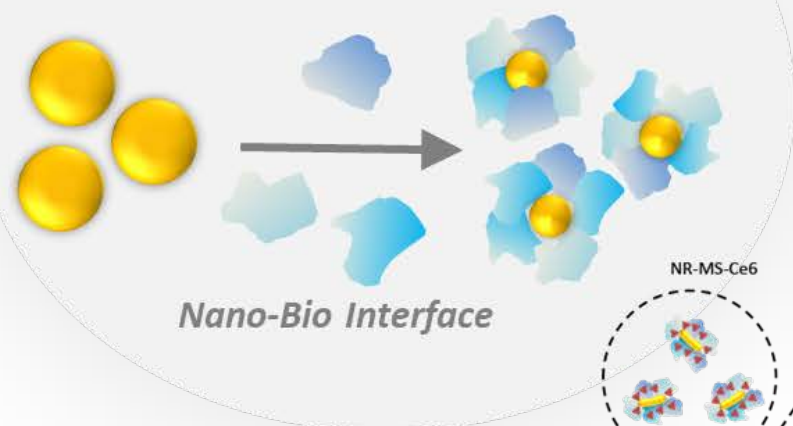
### Biography

Dr. James Kah is 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. Prior to joining NUS in 2012, James was a Postdoctoral Fellow in the Department of Biological Engineering at the Massachusetts Institute of Technology. He is currently the Principal Investigator of the Nanomedicine & Nanorobotics Laboratory at NUS.

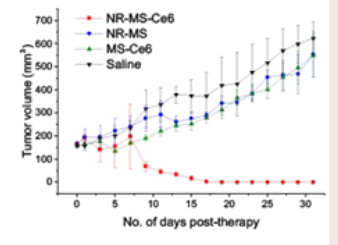
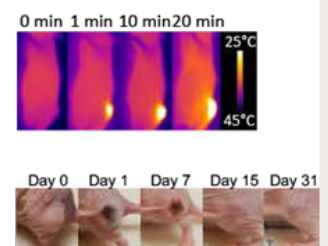
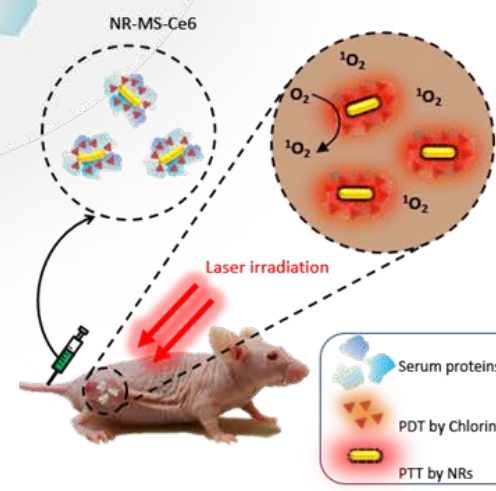
His current research interests focus on understanding the nano-bio interface and developing nanodevices with smart interface strategies to effectively probe and modulate biological processes for diagnostic and therapeutic applications particularly in cancer and infectious diseases.



**1. Understanding the vascular behavior**



**3. Enhance mRNA translation**



**2. Loading and triggered release of drugs**