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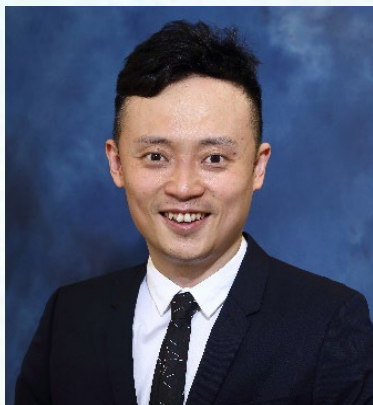
**Department of Pharmacology and Pharmacy**

**Presents**

**Seminar series — Drug Delivery and Translational Medicine**

**Nano–Cell Interactions of Non-Cationic Bionanomaterials**

**by**



**Dr. C. H. Jonathan Choi**

Associate Professor

Department of Biomedical Engineering (BME)  
The Chinese University of Hong Kong (CUHK)

**Date:** 21 April 2023 (Friday)

**Time:** 10:00 a.m. — 11:00 a.m.

**Venue:** Seminar Room 609, 6/F, William MW  
Mong Block, LKS Faculty of Medicine, HKU

**Abstract:**

Bionanomaterials form the basis of important nanomedicine applications, such as gene regulation and COVID-19 mRNA vaccines. Cationic, lipid nanoparticles (NPs) are classical drug carriers due to their high penetration across the negatively charged cell membrane, but they tend to cause cytotoxicity and immune response. Non-cationic NPs (neutral or anionic) generally show higher biocompatibility but enter cells less abundantly. Intriguingly, some types of non-cationic NPs exhibit high biocompatibility and cellular uptake properties, both attractive features for delivery. We are interested in the cell-nano interactions of such special non-cationic bionanomaterials.

The first half of the talk will focus on near-neutral “alkylated gold NPs” with minute amounts of alkyl chains on the gold core. We illustrate how alkylation affects endocytosis and exocytosis in vivo and demonstrate that alkylated gold NPs are self-therapeutic agents against psoriasis. The second half will feature “spherical nucleic acids (SNAs)”, anionic nanospheres derived from the attachment of oligonucleotides to a NP core. We prove that SNAs bind to class A scavenger receptor (SR-A) in vitro and in vivo and show that SNAs boost gene delivery to SR-A-rich macrophages and endothelial cells for treating atherosclerosis.

**Bio:**

Dr. Jonathan Choi is an Associate Professor in the Department of BME and the School of Life Sciences (by courtesy) at CUHK. He received his BS/MS degrees from Stanford in 2005/2006 and his PhD degree from Caltech in 2011, all in chemical engineering. His research interests are non-cationic bionanomaterials, bio-nano interactions, nanomedicine, and drug delivery. Jonathan established the first research lab that focuses on in vivo nanoparticle-based drug delivery and bio-nano interactions in Hong Kong in August 2013 and co-founded CUHK BME in July 2017, the first BME department in Hong Kong. He is an editorial board member of *Pharmaceutics* and *Frontiers of Bioengineering and Biotechnology* and was a guest editor of *Molecular Pharmaceutics*. He is a Senior Member of the American Institute of Chemical Engineers (AIChE) and served as Communications Chair of the Controlled Release Society (CRS) Bioinspired and Biomimetic Delivery Focus Group from 2020 to 2022. He received a Croucher Innovation Award in 2016, a Dean’s Exemplary Teaching Award in 2017, served as Assistant Dean (Student Affairs) in the Faculty of Engineering at CUHK from 2018 to 2021.

**Moderator:** Dr. Weiping Wang, Assistant Professor, Department of Pharmacology and Pharmacy & Dr. Li Dak-Sum Research Centre, HKU  
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Seminar series  
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