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Dr Li Dak-Sum Research Centre
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The University of Hong Kong

**Department of Pharmacology and Pharmacy
& Dr. Li Dak-Sum Research Centre
Present**

Seminar series – Drug Delivery and Translational Medicine
**Core-shell design of nanomedicine for targeted delivery of
biopharmaceuticals**

by



Prof. Nobuhiro Nishiyama

Professor, Laboratory for Chemistry and Life Science,
Institute of Science Tokyo, Japan
Principal Investigator, Innovation Center of Nanomedicine
(iCONM), Kawasaki Institute of Industrial Promotion, Japan

Date: 30 April 2025 (Wednesday)

Time: 10:00 a.m. – 11:00 a.m.

Venue: Zoom Seminar

Zoom Link: <https://hku.zoom.us/j/94511785848>

Meeting ID: 945 1178 5848

Password: 893407

Abstract:

Polymer micelles, core-shell nanoparticles, enhance anticancer drug effectiveness and have progressed to clinical trials. With increasing disease needs, diverse pharmaceuticals like nucleic acids, proteins, and viruses require advanced delivery technology for efficacy and safety. In such background, I believe that even in the development of polymer micelles, technological development based on new material design is necessary in order to realize innovative pharmaceuticals. In this lecture, I would like to talk about the new core and shell design for smart polymeric micelles. As shell design, I would like to introduce pH-responsive polyzwitterions as a new water-soluble polymer to overcome the PEG dilemma, which facilitate cellular internalization and cytoplasmic translocation in response to acidic pH condition, enhancing nucleic acids delivery. As core design, we succeeded in stable encapsulation of proteins, viruses, etc. into polymer micelles by utilizing tannic acid, allowing successful delivery of CRISPR-Cas9/sgRNA complex (RNP) and adeno-associated virus (AAV).

Bio:

Prof. Nobuhiro Nishiyama received his Ph.D. from the University of Tokyo under the supervision of Prof. Kazunori Kataoka. He worked as a postdoctoral fellow at the University of Utah, and then served as an assistant professor, a lecturer, and then an associate professor at Center for Disease Biology and Integrative Medicine, the University of Tokyo. Since 2013, he has been a professor at Laboratory for Chemistry and Life Science, Institute of Innovative Research, Tokyo Institute of Technology, focusing on biomaterials science and drug delivery systems. He has published 206 scientific papers (h-index: 84). He also founded FerroptoCure Ltd., a start-up company developing anti-cancer drugs based on ferroptosis. Prof. Nishiyama has received numerous awards, including the Minister of Education, Culture, Sports, Science and Technology's Prize for Science and Technology in 2019 and the Japan Society for Drug Delivery System Award in 2024.

Moderator: Prof. Weiping Wang, Associate Professor, Department of Pharmacology and Pharmacy & Dr. Li Dak-Sum Research Centre, The University of Hong Kong
For enquiries, please contact Ms. Esther Ng at +852 3917-9123 or esther09@hku.hk

Seminar series
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