



Applications of Synthetic Lipid Nanoparticles in Cancer Vaccines and Gene Editing

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TIME

14:30 – 15:30



VENUE

Y5-203, 5/F Yeung Kin Man Academic Building

ABSTRACT

Lipid nanoparticles (LNPs), as the most advanced nonviral delivery systems currently available, have attracted broad attention and extensive investigation in the field of nucleic acid therapeutics. In this presentation, I will introduce synthetically engineered LNPs developed through chemical design, which feature unique structural characteristics and biodegradable properties, enabling organ- and cell-specific delivery of mRNA. The talk will cover the design principles of LNPs, the molecular and cellular mechanisms involved in their delivery, and will place particular emphasis on representative applications in tumor vaccines and gene editing, as well as our exploration of natural non-Watson-Crick ZUGC alphabets for RNA construction.

BIOGRAPHY

Qiaobing Xu is a Professor in the Department of Biomedical Engineering at Tufts University, USA. He received his Bachelor of Science degree in Chemistry from Jilin University in July 1999, and his Master of Science degree in Polymer Chemistry from Jilin University in July 2002 under the supervision of Professor Xi Zhang. In August 2007, he earned his Ph.D. in Chemistry from Harvard University under the mentorship of Professor George M. Whitesides. From September 2007 to August 2010, he conducted postdoctoral research in the Department of Chemical Engineering at the Massachusetts Institute of Technology in the laboratory of Professor Robert Langer. Professor Xu joined the Department of Biomedical Engineering at Tufts University in September 2010, where he has remained to date. He also holds joint appointments in the Department of Chemical and Biological Engineering at the Tufts School of Engineering and at Tufts University School of Medicine, and is a member of the Genetics, Molecular & Cellular Biology (GMCB) and Neuroscience (Neuro) programs at the Tufts Graduate School of Biomedical Sciences. He has received numerous honors, including the Pew Scholar Award in Biomedical Sciences (2013), the NSF CAREER Award (2015), election as a Fellow of the American Institute for Medical and Biological Engineering (AIMBE, 2020), and designation as a Senior Member of the National Academy of Inventors (NAI, 2024). He also serves as Co-Editor-in-Chief of WIREs Nanomedicine and Nanobiotechnology, published by Wiley.