



The Chinese University of Hong Kong
Department of Biomedical Engineering



Graduate Seminar – PhD Oral Defence

Student : Mr. YANG Zhinan
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Co-supervisor : Prof. QIN Ling
Date : 6 June 2024
Time : 10:00 am
Venue : ERB 1118, William M W Mong Engineering Building

Title: Nucleic Acid-Based Multiscale Cell-Interactive Biomaterials

Nucleic acids possess unique properties such as sequence designability, precise molecular recognition, ease of functionalization, and low toxicity, making them ideal for creating innovative biomaterials. This dissertation focuses on harnessing these properties to develop advanced cell-interactive biomaterials for biomedical applications. Key developments include a DNA-crosslinked hydrogel that responds to microRNA from human mesenchymal stem cells (hMSCs), enhancing their growth and differentiation. Additionally, it details nucleic acid-based nanoscale biomaterials using rolling circle amplification (RCA) and transcription (RCT) systems. These systems, packaged in liposomes, modulate cellular activities, counteract tumor-promoting microRNAs, enhance immune responses, and promote osteogenesis. The research highlights the transformative potential of nucleic acid-based biomaterials in therapeutic strategies for tissue engineering and cancer treatment.

***** ALL ARE WELCOME *****

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