



Department of Biomedical Engineering

香港城市大學
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Precision Nanocapsules for Targeted Drug Delivery and Tissue Regeneration

Dr. Di Wu

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Date: 18 August 2025

Time: 2:30 pm

Venue: YEUNG-B6619, 6/F

Yeung Kin Man Academic Building

Abstract

Drug delivery strategies are crucial for enhancing the efficacy and safety of pharmaceutical products, particularly for macromolecular therapeutics. While nanotechnology has advanced this field by enhancing drug stability, targeting, and controlled release, current delivery strategies still fall short in addressing complex biological barriers and dynamic tissue environments. In this talk, I will present the design and application of precision-engineered nanocapsules that can cross the blood-brain barrier and sequentially release therapeutic cues to establish regenerative niches for stem cell-based therapies. Drawing on preclinical data from murine and nonhuman primate models, as well as human stem cell studies, I will demonstrate how these nanocarriers improve therapeutic efficacy in central nervous system disorders and severe trauma. The work underscores the power of rational nanocarrier design to not only overcome biological delivery barriers but also to guide tissue repair and functional recovery.

Biography

Dr. Wu earned her B.S. in Biology from the University of Science and Technology of China (USTC). She then completed her Ph.D. in Chemical Engineering at University of California, Los Angeles (UCLA), where she developed nanomaterials for the treatment of central nervous system disorders. Following her doctoral training, she joined Prof. Thomas Rando's lab at Stanford University as a postdoctoral researcher, where she focused on stem cell-based therapies and biomaterials for tissue regeneration. In 2023, she relocated with the Rando Lab to UCLA, where she continued her research and was appointed Adjunct Assistant Professor in 2025. Her research interests lie in the spatiotemporal control of drug delivery using nanomaterials for applications in central nervous system disorders and tissue regeneration.