

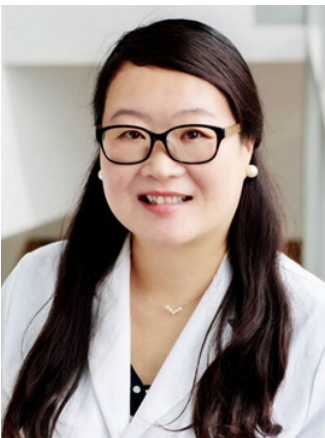
CARNEGIE MELLON UNIVERSITY

BME 2025 FALL SEMINAR SERIES



**BIOMEDICAL
ENGINEERING**
Carnegie Mellon University

Bioengineering of Extracellular Vesicles for Precision Medicine



PRESENTED BY

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Associate Professor
College of Pharmacy
University of Florida

SCHEDULE

Doherty Hall (DH) 2315

**Thursday
September 25, 2025
(9:30-10:30 AM)**

Extracellular vesicles (EVs) are nanosized membrane particles, which have been recognized as the ideal alternative for drug delivery and therapeutic development. EVs are secreted from live cells with minimal toxicity and immunogenicity to in vivo systems, and enable the delivery of a variety of large size payloads including CRISPR Cas9/sgRNA RNP complexes. Recent discoveries also showed the strong ability of EVs to cross difficult biological barriers. However, the heterogeneity of EV surface presentation and diverse molecular makeup make them difficult to study. We reported novel molecular engineering and microfluidic approaches for surface modification, intravesicular payload loading, and biomarker discovery. Particularly, the CRISPR gene editing, and AI directed extracellular vesicle surface engineering overcome the current challenge in tissue targeting specificity in the field, which could lead the promise for developing next-generation precision therapeutics and gene therapy.