



**PHARMACY**  
UNIVERSITY OF MICHIGAN

**PHARMACEUTICAL SCIENCES  
SEMINAR SERIES**

# Extracellular Vesicles for Gene Therapy and Therapeutic Development

December 3 | 4:00 P.M. - 5:00 P.M.

NCRC Building 32 Auditorium

2800 Plymouth Rd, Ann Arbor, MI, 48109



*Presented by  
Dr. Mei He*

Since 2013 Nobel Prize awarded to the vesicle trafficking, substantial efforts have been made to study EV regulatory and biological functions, particularly with roles in several key signaling pathways including cancer metastasis, autoimmunity, and central nervous system. It has been well recognized that EVs are able to cross difficult biological barriers as the emerging and natural drug delivery system. Our recent discovery of human perilymph fluid EVs originating from inner hair cells also suggests that EVs cross bony labyrinth barriers. We also observed that different subtypes and sources of EVs could have distinctive biodistribution profile in vivo, which may imply the specific communications and interactions. However, mechanisms that govern many observed functions of EVs remain far from comprehensive, which is mainly due to technical challenges in studying these diverse nano messengers. Dr. He research brings in novel microfluidic and nanotechnology for surface molecular engineering, cargo loading and transfection, gene editing, and immunoengineering of EVs, which presents an advanced solution for precision gene therapy and therapeutic development. Dr. He research led the standardization of EV isolation and cargo loading at the scale which has been challenging for clinical translation of genome editing technology, and introduced the GMP compatible pipeline for EV isolation, drug loading, and quantitative QC for establishing FDA IND filing. This seminar will discuss the current major hurdles and introduce research advancements on developing EV-based therapeutic therapies.