



Research Theme: Cell Biology
PhD Research Project Title: Cellular Trafficking and Fate of Lipid Nanoparticle-Based Nanomedicines
Scholarship category (Please indicate the source of funding for this project): (a) MOE Research Student Scholarship
Principal Investigator/Supervisor: Lu Lei
Co-supervisor/ Collaborator(s) (if any):
<p style="text-align: center;">Project Description</p> <p>a) Background: Lipid nanoparticles (LNPs) have emerged as a groundbreaking platform in nanomedicine, gaining global recognition for their pivotal role in delivering mRNA vaccines during the COVID-19 pandemic—a contribution that helped save millions of lives. Beyond vaccines, LNPs hold immense potential as delivery vehicles for a broad range of therapeutic nucleic acids, offering promising avenues for the treatment of numerous diseases. Despite this success, the intracellular trafficking and fate of LNPs—specifically, how they navigate within mammalian cells and deliver their nucleic acid cargo—remain poorly understood.</p> <p>b) Proposed work: This project aims to uncover the intracellular trafficking pathways and fate of LNPs. The PhD candidate will use state-of-the-art live-cell light microscopy to visualize and analyze the dynamic molecular and cellular events that occur during LNP transport and delivery within the cell.</p> <p>c) Preferred skills: We are looking for a highly motivated candidate with:</p> <ul style="list-style-type: none">• A strong interest in cell biology, molecular biology, or imaging• Curiosity and passion for exploring the subcellular world• A background in life sciences <p>This is a unique opportunity to contribute to the fundamental understanding of LNPs and their mechanisms of action—knowledge that will help guide the future design of next-generation nanomedicines.</p>
<p style="text-align: center;">Supervisor contact:</p> <p>If you have questions regarding this project, please email the Principal Investigator: lulei@ntu.edu.sg</p>
<p style="text-align: center;">SBS contact and how to apply:</p> <p>Associate Chair-Biological Sciences (Graduate Studies) : AC-SBS-GS@ntu.edu.sg Please apply at the following: Application portal: https://venus.wis.ntu.edu.sg/GOAL/OnlineApplicationModule/frmOnlineApplication.ASPX</p>