THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics
SEMINAR

Designing Liposomes with Cell Membrane Proteins to Modulate Melanosome Transfer

by

Professor Chunhuan LIU (劉春環教授)
College of Food Science and Engineering
Ocean University of China

Date: December 11, 2024 (Wednesday)
Time: 11:00 a.m. – 12:00 n.n.
Place: Rm G25, Science Centre North Block, CUHK

ALL INTERESTED ARE WELCOME
****

Abstract

Cells communicate by transporting vesicles and organelles, a process essential for maintaining cellular homeostasis. However, excessive vesicle transfer can lead to various diseases and conditions, such as hyperpigmentation, which results from unregulated intercellular melanosome transfer. Current treatments often aim to eliminate compartment contents using drugs, but these approaches can cause significant side effects.

In this study, we engineered liposomes with cell membrane proteins to directly disrupt intercellular transport without the need for specialized therapeutics. Using this approach, we successfully reduced melanosome transfer from melanocytes to keratinocytes. To achieve this, we incorporated keratinocyte cell membrane proteins into liposomes via microfluidics. This integration enhanced liposome uptake by melanocytes while reducing their uptake by keratinocytes.

Our results demonstrate that these engineered liposomes effectively reduce melanosome transfer by attaching to the surface of pigment globules, thereby impeding their uptake by keratinocytes. These findings offer a promising strategy for treating hyperpigmentation and introduce a drug-free approach for regulating cellular communication mediated by extracellular vesicles and organelles.

Enquiries: 3943 6303