הטכניון - מכון טכנולוגי לישראל

TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY

הפקולטה להנדסה כימית
ע"ש וולפסון
The Wolfson Department of Chemical Engineering

Wolfson Department of Chemical Engineering Seminar

Monday, February 23th, 2026 at 13:30

Room 6

Selective Membrane Protein Enrichment Enables Defined Biomimetic Nanoparticles for Inflamed Endothelial Targeting

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PhD Final Seminar
Advisor: Dr. Assaf Zinger
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Nanoparticle-based drug delivery systems offer a powerful approach for improving therapeutic precision while reducing off-target toxicity. Among these, biomimetic nanoparticles are particularly attractive because they are engineered to mimic and harness natural cell-to-cell targeting mechanisms. However, many existing biomimetic formulations suffer from poorly defined membrane compositions, which limit reproducibility and hinder clinical translation.

In this lecture, I will present a protein-defined biomimetic nanoparticle platform, termed Particular Nanoparticles (PNPs), created through selective enrichment of specific leukocyte membrane proteins. This strategy enables improved control over nanoparticle composition and formulation reproducibility.

Using microfluidic models that mimic human blood vessels under physiological flow, I will demonstrate that adhesion protein–enriched PNPs exhibit approximately 1.5-fold enhanced interactions with inflamed endothelium compared to standard Leukosomes. Overall, this work outlines a general strategy for designing reproducible, targeted nanocarriers with clear translational potential.

Refreshments will be served at 13:15.