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 Special Seminar

Lecture Hall 6, Wolfson Department of Chemical Engineering,

25.1.2016 at 13:30

Dana da Silva Curiel

Advisor: Assist. Prof. Avi Schroeder

The Effect of Lipid Composition on Liposome Uptake by Triple Negative Breast Cancer

Liposomes, vesicles with an inner aqueous core that is surrounded by a lipid-bilayer membrane, are widely used as drug delivery platforms in cancer research and therapy. The liposome's membrane composition controls the drug release profile as well as its biodistribution and pharmacodynamics.

Here, we studied how different lipid compositions affect the uptake of liposomes by triple-negative breast-cancer cells. We found that the length of the fatty acyl chain has minor influence on liposome uptake, slightly favoring the 16C 1,2-dipalmitoyl-*sn*-glycero-3-phosphocholine over 14 or 18 carbon-long lipids. Cholesterol content showed an inverse association with uptake. Liposomes with a low (20%) cholesterol content reached maximal uptake, 7 times greater than the uptake of formulations containing a high (60%) cholesterol content. Changing the head group greatly affected liposome uptake. The inclusion of 10% phosphatidic acid more than tripled liposome uptake and addition of 10% phosphatidylethanolamine doubled the uptake, compared to liposome comprised of phosphatidylcholine.

Most interestingly, we found that the uptake kinetics is affected by liposome-to- cancer cell ratio; the lower liposome concentrations had higher uptake efficiency.

Modifying the lipid composition is a new mode for affecting cellular uptake kinetics.

Refreshments will be served at 13:15