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
Hall 108, Wolfson Department of Chemical Engineering,
Tuesday April 30th at 2pm

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Personalized Nanomedicine for Treating Metastatic Cancer

Cancer is a leading cause of death worldwide. Nanotechnologies are becoming impactful medical tools, granting therapeutic accuracy and potency that cannot be attained using systems of larger scale. Various assays have been developed for detection and quantification of nanoparticles during the past decade. Quantum dots, carbon nanotubes and various small-molecule fluorescent dyes that can be detected using whole animal imaging systems. New nanomaterials are providing novel ways of detecting markers at extremely low concentrations. Recently, synthetic DNA has been suggested as a scaffold for diagnostic applications. As an example of this technology is Barcode DNA assay which enables detecting proteins, hormones and DNA. This technology offers a wide range of advantages including a low limit of detection, high sensitivity, short detection time and versatility. DNA barcodes will be introduced into 100-nm liposomes during the formulation process for future identification. Our approach is to utilize nanoparticles to gauge the therapeutic potency of anticancer drugs, specifically, to explore and optimize the therapeutic payload a single drug-loaded nanoparticles must carry to be capable of altering a primary biological function in a counterpart single cancer cell. I propose herein, that as targeting modalities are improving, future nanomedicines must be tailored to carry the effective dose to surgically treat only the targeted diseased cell. This requires elucidating the therapeutic payload each nanomedicine must carry to the target cell.