Lecture Series: Photosensitive Cancer Nanomedicine for On-Demand Delivery of Small Molecule Drugs and RNAi Therapeutics

**Event Type:** IBBR Seminar Series  
**Contact Person:** Ella Mihailescu  
**Event Info**  
**Date:** Dec 2 2019 - 11:00am to 12:00pm  
**Location:** Auditorium  

**Details**  
**Speaker/Presenter:** Anu Puri  
**Speaker Title:** TBD  
**Speaker Affiliation:** National Cancer Institute at the NIH  

**Event Description:**
Cancer nanomedicine is a promising field for improved delivery of drugs and bioactive agents, including nucleic acids, and areas for further developments for its clinical translation have been recognized 1-3. Nanoparticles with desirable biodistribution characteristics, improved plasma stability in vivo as well as viable technologies for on-demand spatial and temporal release of loaded cargo from the nanoparticles are important considerations to enhance the clinical suitability of nanomedicine. We are developing tunable nanoparticles for site-specific cargo release by utilizing suitable light sources. Our design strategy entails (i) selection of photosensitive molecules that can be activated by a tissue-penetrating light sources with preferred biological activity of their own, (ii) incorporation of these agents into nanoformulations without modifying the biophysical properties of the nanoformulation, (iii) minimization of off-target effects of the nanomedicine with no biological activity before photoactivation, and (iv) develop formulations with enhanced plasma stability as well as preferred tumor accumulation. This presentation will include studies related to: (i) Development of lipid-based nanoparticles (LNPs) for tumor-specific delivery of multiple drugs at the tumor site upon photoactivation4.

(ii) A Binary Stealth Lipid System for Delivery of Hydrophobic PDT drugs and enhanced
tumor care.
(iii) Sulfonated polymers for light-mediated cytosolic delivery of siRNA for RNAi activation.
We are pursuing these studies to further develop these systems and evaluating the exact mechanism(s) of enhanced gene silencing activity upon photoactivation.

Setup

**IT Setup:** Projector
Lavalier Microphone
Wireless PPT
Remote