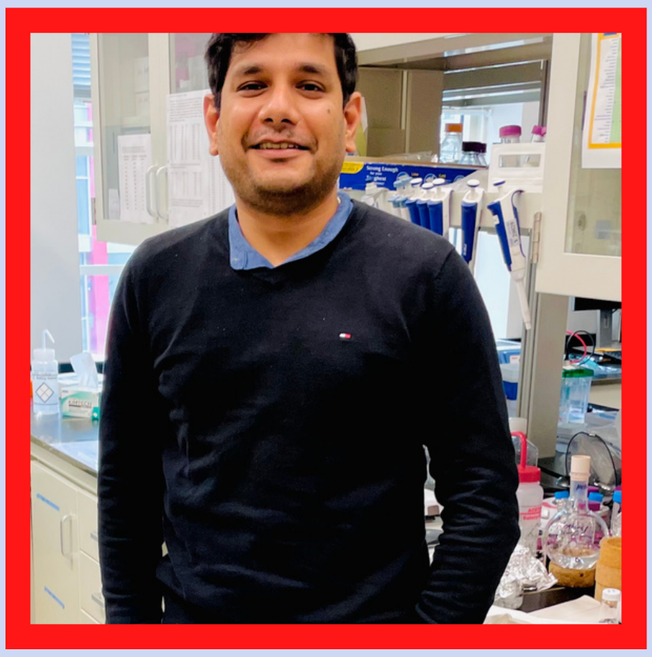
NJIT New Jersey Institute of Technology

BME

Department of Biomedical Engineering

Graduate Seminar



Dr. Indrajit Srivastava

Postdoctoral Research Associate
Department of Bioengineering
Department of Electrical & Computer Engineering
University of Illinois

Feb 22 (Wed)
2:30pm - 4:00pm
FENS 698

Nature-Inspired Biomimetic Nanosensors for Image-Guided Therapeutic Interventions and Early Disease Diagnostics

Abstract:

With the emergence of nanotechnology, the field of biomedicine has been ushered into a new dawn for early diagnosis and treatment regimens for a multitude of human diseases. However, the design and development of functional nanoconstructs are often hindered by biological barriers and constraints of material characteristics that can negatively impact their efficacy when introduced into a physiologically relevant system. In this seminar, I will discuss how combining nanoengineering design principles and natural materials helps us overcome these challenges and leads to the development of biomimetic nanosensors for image-guided surgical and therapeutic interventions for cancer, cardiovascular diseases (CVD), and bacterial pathogenesis. I will discuss how designing biomimetic nanoparticles mimicking the chemical attributes of red-blood-cell can be used to accurately delineate tumors from healthy regions and simultaneously provide a qualitative indicator of metastases cancer progression, thereby assisting fluorescence-guided cancer surgeries. Furthermore, I will discuss a new class of biomimetic surface-enhanced Raman scattering (SERS)-plasmonic nanosensors with improved dispersibility characteristics and enhanced SERS signal brightness can be used for spectroscopy-guided tumor cell identification and multi-modal cancer surgery.

About the Speaker

Dr. Indrajit Srivastava is currently a Postdoctoral Research Associate at the Departments of Bioengineering and Electrical & Computer Engineering at the University of Illinois at Urbana-Champaign (UIUC). His postdoctoral work in the labs of Prof. Shuming Nie and Prof. Viktor Gruev focuses on designing biomimetic nanocarriers for fluorescence and spectroscopy-guided cancer detection and surgical interventions. As a Ph.D. student under the mentorship of Prof. Dipanjan Pan at UIUC, his thesis focused on developing intrinsically fluorescent, polymeric nanoparticles called carbon dots and expanding their applications as nanotherapeutics, in vivo bioimaging of diseases, and array-based biosensing of analytes. His works have been published in high-impact scientific journals and received several awards, like Baxter Young Investigator Awards, ACS PMSE Future Faculty Scholar, and Alexander von Humboldt Research Fellowship.