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ANNUAL BIOTECHNOLOGY CONGRESS

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Engineering biomaterials for medical imaging of cancer

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Imaging is a fundamental tool in the practice of medicine. The interaction of medical imaging radiation with new materials has long been exploited to develop new and improved imaging systems and techniques. In parallel with these advances, there is increasing interest in developing new contrast agents for the diagnosis of disease. Exogenous contrast agents are non-native sources of contrast that differentially scatter, absorb, or emit medical imaging radiation (e.g., sound waves for ultrasound imaging, radiofrequency waves for magnetic resonance imaging, near IR light for photoacoustic imaging, and x-rays for computed tomography and mammography) as compared to surrounding tissues and inherent background noise such that their location can be tracked upon introduction into a patient. At the forefront of new contrast agent development are new, clinically-relevant, materials that can be activated by medical imaging radiation external to the patient and under image guidance, to characterize and treat cancer. Since the contrast agents' *in-vivo* distribution and interaction with radiation are strongly size- and material-dependent, a new opportunity in engineering is the creation of new nanoscale systems that can be tailored for specific contrast imaging and with therapeutic properties. This talk will focus on the development of new perfluorocarbon agents that can facilitate more focused and targeted delivery of cancer therapies to tumours for higher therapeutic ratios, and can permit the treatment of hard-to-access organs like the brain in a minimally-invasive manner

Speaker Biography

Dr. Naomi Matsuura, PhD, P.Eng., is currently an Associate Professor in Materials Science & Engineering and the Institute of Biomaterials & Biomedical Engineering (IBBME) with a cross-appointment in Medical Imaging at the University of Toronto. Dr. Matsuura leads a research program at the intersection of nanoengineering and medicine, focusing on the design of new contrast agents to guide the imaging and treatment of disease. Awards and recognitions include the John C. Polanyi Prize in Physiology/Medicine and Physics, an NSERC Discovery Accelerator Award, and the Early Researcher Award from the Ontario Ministry of Research and Innovation.

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