BIOENGINEERING & BIOMEDICAL ENGINEERING RESEARCH SEMINAR

ASSEMBLY AND ENGINEERING OF PROTEIN-BASED NANOPARTICLES

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Supramolecular self-assembly, or multistep non-covalent synthesis, has emerged as an exciting driver of nanoscale biotechnologies and designer biomaterials. My interests lie in understanding and exploiting the processes and outcomes of non-covalent synthesis for both natural and synthetic protein-based nanoparticles. The research of my team uses biomolecular and bioprocess engineering to create viral capsid-based particles as well as peptide-stabilised nanoscale emulsions with sophisticated functionality. The development of advanced applications in drug delivery, molecular imaging and vaccine design are underpinned by fundamental research in virus-like particle self-assembly and the interfacial properties of peptide-stabilised emulsions. Relating the molecular details of nanoparticle interfaces to interactions with biological environments, we hope to deepen our understanding of the structure-function relationship of both particle types to enable and optimise their controlled functionalisation. Our work in elucidating the molecular details of protein-based nanoparticle structure is supported by bioprocess development in both plant-based and prokaryotic expression platforms. The ultimate outcome is rational engineering of these bio-derived particles to provide ex vivo synthetic biology solutions to a number of significant challenges in manufacturing and health.

September 16
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1:30PM

McGill | Department of Bioengineering

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