BIOLOGY AND BIOMEDICAL ENGINEERING
RESEARCH SEMINAR

FABRICATING FUNCTIONAL DEVICES USING SELF-ASSEMBLING PROTEINS

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ABSTRACT

Nature has evolved microorganisms, macromolecular protein assemblies and biopolymers with exquisite properties. Of particular interest and are protein materials, which can display complex nanoscales features, modular structures, and tunable surface chemistry. Furthermore, proteins can often be easily genetically engineered to tune their properties and rationally design novel materials with custom functions. Such properties are very useful for creating scaffolds and for coordinating the assembly of nanoscale materials in a variety of devices with environmental or bioenergy applications. Using protein structures as building blocks to assemble devices provides a sustainable and environmentally-friendly alternative to conventional inorganic or polymeric materials used for the fabrication of consumer goods. In this talk, I will present examples of protein materials that we have assembled to produce macroscopic functional thin films, gels and coatings. I will also describe potential applications for protein structures with novel physical properties.

BIO

Dr. Noémie-Manuelle Dorval Courchesne is currently an Assistant Professor of Chemical Engineering at McGill University. She earned her Ph.D. in Chemical Engineering from MIT in 2015, and then worked as a postdoctoral fellow at the Wyss Institute for Biologically Inspired Engineering at Harvard University until 2017. Dr. Dorval Courchesne's research focuses on the development of protein-based materials with novel physical properties, and on the fabrication of functional biologically derived devices. Her research group applies materials science, bioengineering, and nanotechnology principles to address energy and environmental challenges.

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