Northeastern University
College of Engineering

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Hosted by the Department of Chemical Engineering

Distinguished Seminar Speaker

Protein-based materials for sustainable bioprocesses

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USDA NIFA AFRI Postdoctoral Fellow

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Abstract: Protein materials, whose function can be programmed by their amino acid sequence, possess the potential to address many societal challenges by providing a sustainable and biocompatible alternative to many traditional materials. As an example, the enhancement of enzymes for biocatalysis serves as a gateway for more sustainable chemical manufacturing. I will demonstrate that by designing an enzyme to fuse to a solid support material, we can vastly improve its stability and recover the material between reactions for multiple uses. Protein materials also serve as a platform for targeted delivery in medicine and agriculture. I will show that by transforming inactivated plant viruses into spherical nanoparticles for encapsulation, hydrophobic agrochemicals can be delivered through the soil and paralyze roundworms for pest management with high efficacy.

Biography: Adam Caparco, Ph.D. is a postdoctoral scholar at the University of California, San Diego in the Department of NanoEngineering. His research under Prof. Nicole Steinmetz is funded by a USDA NIFA fellowship and is focused on using plant virus nanoparticles as agricultural delivery systems for pest management and genetic engineering of plants. Prior to this position, Dr. Caparco completed his doctoral work in Biomolecular Engineering at Georgia Institute of Technology under Profs. Julie Champion and Andreas Bommarius, where he focused on using self-assembled protein materials for sustainable biocatalysis. During his doctoral studies, he was awarded a STEM Chateaubriand fellowship and worked with bioinformaticians and biochemists at Genoscope in France. As an undergraduate, Dr. Caparco studied Chemical and Biomolecular Engineering at the University of California, Los Angeles.

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