Chemistry Seminar

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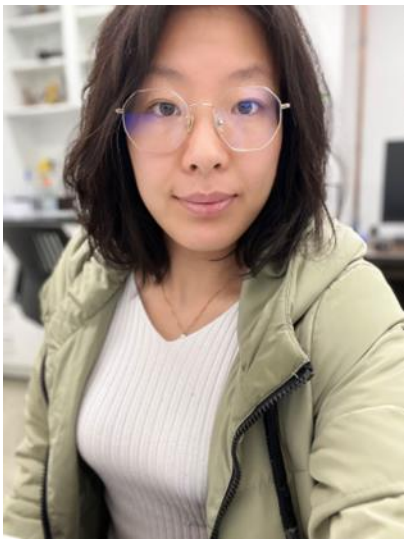

Monday, 26 February 2024

4:00 pm in 303 Schrenk Hall

Nucleic Acid from Biosensing to Future Electronics

Abstract: DNA's remarkable efficacy in nanoconstruction is primarily attributed to its reliable Watson-Crick base pairing (A-T, C-G) enabling precise and programmable interactions. Its well-explored molecular conformation as a right-handed double helix with defined dimensions makes it an idea candidate for engineering nanostructures. Notably, DNA origami, a technique involving- DNA folding, has emerged as a versatile nanoscale platform widely utilized across diverse disciplines, including chemistry, physics, electrical engineering, and biology. A comprehensive understanding of the physical and chemical properties of DNA-based materials is paramount for fabricating materials based on DNA.

In addition to its role as a foundational building block, DNA possesses exceptional biocompatibility, thermal stability, and the ability to be functionalized, rendering it a captivating material for biosensing applications. Recognized for its proficiency in detecting specific targets such as nucleic acids, proteins, and small biological molecules, DNA and its assembled structures show great promise in biosensing.

This presentation delves into two specific projects. The first project focuses on investigating the nanomechanical properties of DNA origami nanostructures by utilizing Atomic Force Microscopy (AFM) for precise quantitative measurements of their elastic properties. The second project revolves around the development of a biosensor for COVID 19 detection utilizing an MXene-graphene-based field-effect transistor (FET).