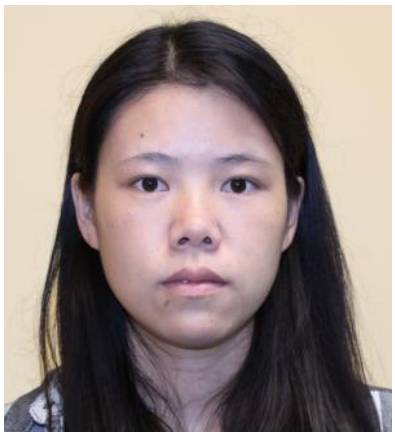
Department of Chemistry Seminar Series
Spring 2023

Friday, March 10, 2023, 3:30 PM – HPA1-O119 (Health Sciences)

Noble metal nanoparticles as peroxidase mimics and their application in bioassays



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Noble metal nanoparticles (NPs) with peroxidase-like activity as peroxidase mimics are widely used in enzyme-linked immunosorbent assays (ELISA) for the detection of proteins, antibodies, peptides and hormones in the biological fluids for the diagnosis of several diseases, where the peroxidase mimics act as a catalyst to speed up the reaction. The performance of noble metal NPs in the application of bioassays is largely determined by their catalytic activity, which can be tune and optimized by adjusting the morphologies, such as size, shape, elemental composition and surface ligand. We investigated the size effect in nanozymes by using Pd-Ir NPs as a model system. Smaller Pd-Ir NPs has lower LOD for the detection of CEA in ELISA. We then investigated the ultrasmall Ir NPs as efficient peroxidase mimics for colorimetric bioassays of CEA and AFB1 and showed enhanced detection sensitivities compared to conventional natural peroxidase-based assays.