

Department of Chemistry & Biomolecular Science
Clarkson University
PhD Defense

Paulina Wells

will speak on

***Development of Novel Portable Biosensors for
Biomarker and Drug Analysis with Smartphone-
Adapted Readout***

Abstract:

Growing interest in the biomedical field requires the development of reliable, sensitive, and selective methods for analysis of drug and biomarker content in the biological fluids. Due to the continuous innovations in the molecular biology/genetic engineering and material science fields, there is a huge possibility that gaps in diagnostics will be filled soon. This presentation will discuss the development of easy to use, portable and low-cost biosensing platforms. The technology is based on silica nanoparticles (SiO₂-NPs), enzyme and a mediator/dye (phenazine methosulfate or its analogue, 1-methoxy-5-methylphenazinium methyl sulfate) that altogether have properties allowing the detection of the specific target analytes. All biosensors developed in this work were used for an optical analysis of specific substrates. The final result was obtained by processing photographs of generated fluorescence on the sensing spots, using a smartphone for image handling and digitizing. The designed sensing interface is suggested as a universal analytical platform which can be used with many natural and artificial NAD⁺-dependent and PQQ-dependent enzymes. This work demonstrates potential usage of the biosensors in the biomedical and forensic applications. The results of this research provide foundations for the future development of simple, portable biosensing arrays that are a great competition for advanced laboratory analysis requiring well trained staff and expensive equipment.

Tuesday, April 26, 2022, 10:00 am EST

In-Person Location: BH Snell 330

Petersen Board Room

ZOOM Meeting Link:

<https://clarkson.zoom.us/j/92129853849>