INVESTIGATING THE BINDING PROPERTIES OF METAL OXIDE NANOPARTICLES, NANOPLASTICS, CASEIN MICELLES, AND LIPOSOMES WITH FLUORESCENT ORGANIC DYE AND SALT. **Edward P.C. Lai**, Amos Onomhante. Carleton University, Department of Chemistry, 1125 Colonel By Dr, Ottawa, ON K1S 5B6, Canada. (edward.lai@carleton.ca)

The motivation for this work was to develop a laser-induced fluorescence technique for the direct analysis of various metal oxide nanoparticles, nanoplastics, casein micelles, or liposomes present in water samples. Our strategy involved the addition of a fluorescent dye/salt to each sample for binding with the target analytes. The % binding, based on a decrease of the dye/salt fluorescence intensity due to quenching, depends on the number of surface binding sites on each analyte. This new approach enables high-throughput analysis for screening environmental water samples, based on the fast binding kinetics and rapid measurement of fluorescence emission intensity. Experimental results have been obtained in our lab to verify binding of rhodamine 6G dye and acridine orange salt with transition metal oxide nanoparticles, polystyrene nanospheres, casein micelles, and soy lecithin liposomes. Binding percentages as high as 98(±2)% were attained for the liposomes when using a dye/salt concentration of 125 mg/mL, a diode laser operated at l_{ex} of 480 nm, and an interference filter collecting only emission photons with l_{em} of 580 nm. Capillary electrophoresis was employed to separate the free dye/salt from the dye/salt-bound liposomes, thus eliminating any potential interference and guaranteeing high accuracy of % binding determination within 10 min.