

DEPARTMENT OF CHEMICAL AND ENVIRONMENTAL ENGINEERING  
COLLEGE OF ENGINEERING & APPLIED SCIENCE

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: 03/01/2023

**PROJECT TITLE: Developing fast responding solutions for removing cyanobacteria, cyanotoxins, and nutrients with coagulation/flocculation/sedimentation by characterizing site-specific bloom-related environmental factors**

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### **Project Description**

In cyanobacteria harmful algal blooms (cyanoHABs)-affected areas, drinking water treatment processes are optimized to ensure the absence of cyanotoxins in their finished water. Coagulation, flocculation, and sedimentation (C/F/S) are considered the first barrier to eliminating cyanobacterial cells and cyanotoxins entering drinking water treatment facilities. However, there are significant knowledge gaps in understanding the effects of site-specific environmental factors on water chemistry, the population dynamics of cyanobacteria, and their fate and transport through C/F/S. Such fundamental understanding is critical for the development of efficient risk management tools for drinking water treatment facilities as well as surrounding watershed ecosystems.

In this study, we will test a continuous flow C/F/S mobile system to remove cyanobacteria and cyanotoxins from Ohio's freshwater. Considering the site-specific difference in water quality and population dynamics of cyanobacteria, water samples will be on-site tested using the C/F/S mobile system under the optimum conditions obtained from the batch experiments at various lakes, reservoirs, and rivers in Ohio including Lake Erie, Great Lake St. Marys, and Ohio River between May and August 2023.

Skills required:

Driver license

Capability for the on-site test

College Chemistry

Microsoft Excel and PowerPoint