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The role of hydrogen peroxide in the structure and function of toxic cyanobacterial blooms in Lake Erie

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Abstract: Cyanobacterial harmful algal blooms are a pervasive threat to water resources and freshwater ecosystems worldwide. Their ability to produce toxins is a concern for drinking water supplies. Although nutrient inputs are well recognized as the cause of these blooms, the specific controls on their toxicity remain largely unknown. Working with a team of researchers from U-M and NOAA-GLERL, we are studying cyanobacterial blooms in Lake Erie in order to understand the environmental and ecological controls on bloom development and toxicity. This talk will focus on the potential role of hydrogen peroxide in shaping the structure and function of Lake Erie cyanobacterial blooms. I will present data showing the toxicity of Lake Erie blooms varies dramatically, and may be linked to hydrogen peroxide, which reaches concentrations high enough to potentially favor toxic versus non-toxic strains of *Microcystis*. Patterns of hydrogen peroxide suggest that it is biologically produced and consumed, and that heterotrophic bacteria may play a key role in determining its concentration.

