Genus Specific Detection of Toxic Cyanobacteria

Inventors: Jingrang Lu

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TRL 3

Context

Cyanobacterial harmful algal blooms (HABs), which can appear in water bodies across the country during warm weather months, are an indicator of poor water quality and can potentially cause serious environmental concerns, including human and aquatic health effects. When cyanobacterial HABs occur in recreational waters or source waters used for drinking, the toxins that may be released can cause respiratory or skin irritation and even illness in humans, domestic animals, and wildlife. Historically, monitoring these blooms has been labor intensive and limited due to cost, time, and logistical constraints.

Summary

EPA inventor Jingrang Lu created a technology that will help water officials monitor the toxic cyanobacterial level in recreation and drinking water sources. Called "Genus Specific Detection of Toxic Cyanobacteria," this technology will help water officials quickly and accurately determine when specific toxin-producing cyanobacteria are beginning to grow too rapidly for safety. Specifically, water officials using the Genus Specific Detection of Toxic Cyanobacterial technology will be able to detect and quantify the amount of microcystin producing cyanobacteria through qPCR and RT-qPCR. This is important because exposure to this toxin can potentially lead to the development of gastrointestinal, neurological, and liver disorders. The technology is portable, easy to use, and improves on existing field technology by quantifying the level of cyanobacteria. By using this technology, water officials will be better empowered to keep our recreation and drinking water sources clean and safe for all.

Potential Applications
- Site Remediation
- Emergency Management
- Water Purification

Contact
Meghan Sheehan, JD, CLP
Federal Technology Transfer Act (FTTA) Specialist
www.epa.gov/ftta

U.S. Environmental Protection Agency
Office of Research and Development