

Cyanobacteria water contaminations. A fluorescence-based method to detect the presence of toxic microcystin molecules in water

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For many years water microbiology contaminations have been ruled by a traditional approach due to a limited understanding of the native water bacterial composition and its function. In different areas of the world, water is obtained directly from underground through a borehole. Then it is collected by users and used without prior treatments. This is mainly due to the lack of sensitive, fast methods to detect both the indigenous microbial cells and the presence of relevant pathogens [1].

Cyanobacteria are photosynthetic prokaryotic microorganisms that live in diverse range of environments, from freshwater to marine ecosystems [2]. Cyanobacteria belonging to the genera *Microcystis*, *Anabaena*, *Planktothrix*, and *Nostoc* produce and release in water harmful toxin molecules, named microcystins. The ingestion or inhalation of microcystins can have severe effects on health [1].

Here, we present a novel analytical method to detect the presence of toxic microcystins in water. The method lays on the use of fluorescence labelled monoclonal antibody to design a competitive resonance energy transfer-based assay for a sensitive and realist detection of the presence of microcystins in water. The assay showed a sensitivity of 0,245 µg/L, that represents a value lower than the limit value set by the World Health Organization.

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[2] Mehdizadeh Allaf M. and Peerhossaini H. *Microorganisms* (2022), 24, 10(4), 696-719.

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