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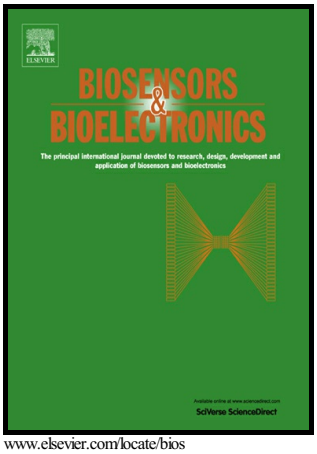

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Upconversion nanoparticles grafted molybdenum disulfide nanosheets platform for microcystin-LR sensing

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Abstract

Water safety is one of the most pervasive problems afflicting people throughout the world. Microcystin-LR (MC-LR), a representative toxin released by cyanobacteria, poses an increasing and serious threat to water safety. In order to develop facile, specific and sensitive detection methods for MC-LR, we fabricated an ultrasensitive fluorescence aptasensor using the enhanced fluorescence of UCNP and the effective quenching ability, high affinity toward single strand DNA (ssDNA) of MoS_2 (termed as FAUM). This assay specifically determined MC-LR in the linear range of 0.01-50 ng/ml with a limit of detection (LOD) of 0.002 ng/ml. The real water sample results indicated that this FAUM assay owns well enough reliability and feasibility to allow the determination of MC-LR. This aptamer-based method might be a promising strategy for a variety of sensing applications.

Keywords: MoS_2 Upconversion nanoparticles Aptamer MC-LR