

## **Simple analysis system for the rapid and sensitive detection of major ciguatoxin congeners**

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Ciguatera is a foodborne poisoning caused by the ingestion of fish contaminated with ciguatoxins (CTXs). Ciguatera is a dire public health issue, since it causes long-lasting neurological effects and more importantly, has no cure. Moreover, ciguatera, earlier considered to be geographically limited in tropical areas, is now being reported outside these locations. This accentuates the need for the development of efficient and rapid methods to detect CTX. Our study is based on a previously established immunoassay for detection of the major CTX congeners (CTX1B and CTX3C series) using magnetic beads and a sandwich format. We have optimized the assay by drastically reducing the time, resources and labour used, establishing a system that can be applied in resource-scarce settings. The 40-minute assay provides a specific and reliable colorimetric signal for CTX1B. The performance of the system has been tested on fish samples and the limit of detection has been found to be 0.01 ppb, which is aligned with the FDA specifications. In addition to this, the reagents have shown appropriate storage stability. Designed to facilitate detection of CTXs, especially in the lower resource settings, our system would proficiently help in the ciguatera surveillance, risk assessment and management in such areas, significantly decreasing health and economic burdens.

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