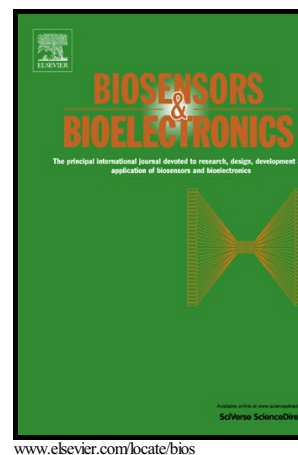


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A Nanocoaxial-Based Electrochemical Sensor for the Detection of Cholera Toxin

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ABSTRACT

Sensitive, real-time detection of biomarkers is of critical importance for rapid and accurate diagnosis of disease for point of care (POC) technologies. Current methods do not allow for POC applications due to several limitations, including sophisticated instrumentation, high reagent consumption, limited multiplexing capability, and cost. Here, we report a nanocoaxial-based electrochemical sensor for the detection of bacterial toxins using an electrochemical enzyme-linked immunosorbent assay (ELISA) and differential pulse voltammetry (DPV). The device architecture is composed of vertically-oriented, nanoscale coaxial electrodes in array format ($\sim 10^6$ coaxes per square millimeter). The coax cores and outer shields serve as integrated

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