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HIGH THROUGHPUT SCREENING OF PATHOGENS AND TOXIN USING NOVEL BIOSENSOR TECHNOLOGIES

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High throughput screening tools for rapid pathogen testing are in high demand. The advances in biophysical methods in diagnostics have created an increasing interest in detection technologies for rapid analysis of samples. Current pathogen detection trend emphasizes the application of single platform for detection of multiple pathogens/toxins in a cost effective manner. Our research team is currently developing high throughput nano/biosensor-based screening tools such as microfluidic biochip, fiber optic, cell-based and light scattering for detection of multi-pathogens and toxins from food. Cell-based sensor determines virulence potential and is suitable for confirmation of pathogens or toxins present in a sample while light scattering sensor is a label-free method for real-time detection and identification of bacterial colonies on agar plates. Pathogen-specific sensor platforms such as microfluidic biochip and fiber-optic sensors are developed employing pathogen-specific probes such as receptors, antibodies and aptamers. Limit of detection, specificity, automation and application of each sensor with various sample matrices will be discussed.

Keywords: Biosensor technologies, pathogen/toxin detection, rapid pathogen testing

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