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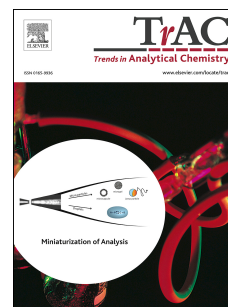
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# Advances in Structure-Switching Aptasensing Towards Real Time Detection of Cytokines

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## ABSTRACT

Structure-switching aptamer-based biosensors (aptasensors) provide a promising strategy for real-time or near real-time monitoring of analytes *in vivo*, owing to their reversibility, the versatility of methods available to engineer the aptamer switches, and the ability to tune their dynamic range. Monitoring cell-to-cell communication through cytokine secretions has enormous value in biology and medicine. However, cytokine detection is challenging due to the extremely dynamic, transient cytokine secretion process, and typically low abundances in physiological conditions. Here, we summarise recent advances in structure-switching signaling aptamer-based biosensing with specific focus on cytokine sensing. This Review begins with the survey of cytokine-specific aptamers followed by the designs of elegant sensing platforms based on structure-switching aptamers with different signal readouts such as optic, electrochemistry, and other types. We describe the strategies of signal amplification in aptasensors, and highlight future perspectives of aptasensors for real-time or near real-time detection of cytokines.

**Keywords:** Structure-switching aptamers; Biosensors; Cytokines; Real time biosensing; Signal amplification; *In vivo* detection

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