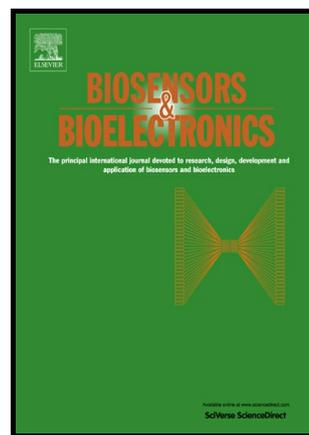


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# A sample-to-answer, real-time convective polymerase chain reaction system for point-of-care diagnostics

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## Abstract

Timely and accurate molecular diagnostics at the point-of-care (POC) level is critical to global health. To this end, we propose a handheld convective-flow real-time polymerase chain reaction (PCR) system capable of direct sample-to-answer genetic analysis for the first time. Such a system mainly consists of a magnetic bead-assisted photothermolysis sample preparation, a closed-loop convective PCR reactor, and a wireless video camera-based real-time fluorescence detection. The sample preparation exploits the dual functionality of

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