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TECHNOLOGY
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PENDING

(IN202311071192)
Detection of human metabolites using microscaled homogenous single electrode electrochemiluminescent biosensor

NEED

Delayed or inaccurate detection of key metabolites in clinical and forensic settings leads to misdiagnosis, prolonged treatment, and legal ambiguities. Current testing systems rely on bulky equipment, large sample volumes, and inconsistent manual handling. But what if biomarker detection was simplified at the micro-scale?

TECHNOLOGY OVERVIEW

This invention introduces a microfluidic-based visual detection platform for human metabolites using precise sample control and luminescence generation. The design includes a Y-junction micromixer, a microchannel-integrated sensor, and CAD-based fabrication. The device minimizes waste, enables rapid analysis, and integrates automation potential into a single, compact, chip-scale system.

TECHNOLOGY KEY FEATURES

Y-junction microfluidic chip with PDMS stamping enables mixing and detection in less than 10 µL volume. Electrode-integrated luminescence readout ensures precise metabolite visualization without large machines or delays.

MARKET ANALYSIS

The global microfluidics market is projected to grow at 16.2% CAGR, reaching $45.3 billion by 2033 (Market Research Future, 2023). Growth is driven by point-of-care diagnostics, low-cost testing, and lab-on-chip innovations. India sees increasing adoption in portable diagnostics and wearable biosensors.

Target Industries

Target Industries: diagnostic platform developers, forensic toolkit manufacturers, personalized medicine test providers and/or microfluidic chip makers, medical device integrators and/or clinical labs, bioanalytical solution firms, and academic-industrial labs working on low-volume rapid screening.

AT A GLANCE

SDG 3: Good Health and Well-being; SDG 9: Industry, Innovation and Infrastructure; SDG 12: Responsible Consumption and Production

Read more here

Technology is available for licensing/ co-development.

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