

Dual-Labeled E-AB Platform for Continuous, Real-Time Monitoring of Small Molecules

Tech ID: 27069 / UC Case 2016-99M-0

BRIEF DESCRIPTION

A dual-reporter correction to enhance the performance of electrochemical aptamer-based sensors in whole blood.

BACKGROUND

Historically, several methods have been employed to quantify small molecules and biomarkers in diluted or undiluted blood. However, these methods are very cumbersome and some of them only work for diluted whole blood. Further, they usually fail when applied for real-time, continuous monitoring of the target of interests in whole blood. While such a technology could, for example, provide maximal information about drug levels in blood throughout the day and enable sensitive, real-time dose adjustments and optimal treatment decisions for the patients, achieving this has proven difficult as the design and preparation molecular sensors that can be used in whole blood for real-time and long-term measurements has proven very challenging.

DESCRIPTION

To combat this, researchers at UC Santa Barbara have created a dual-reporter correction to enhance the performance of electrochemical aptamer-based sensors in whole blood. This sensor architecture paves a way to real-time and continuous metabolic, pharmacokinetic and drug-response measurements. The approach largely eliminates the drift observed for both cocaine and aminoglycoside-detecting E-AB sensors, reducing drift of order 25% - 30% to less than 2% over many hours of continuous operation in flowing, undiluted whole blood.

ADVANTAGES

- ▶ Corrects for sensor drift in flowing whole blood
- ▶ Baseline drift corrections for more than 20 hours

APPLICATIONS

- ▶ Monitoring of narrow therapeutic index drugs
- ▶ Monitoring specific molecules in complex matrices such as tissue culture
- ▶ Can be used in sensors for the detection of a range of small molecule drugs and metabolites as well as for proteins

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OTHER INFORMATION

KEYWORDS

indpharma, Sensors,
Electrochemical aptamer-
based sensors

CATEGORIZED AS

- ▶ **Biotechnology**
- ▶ Other
- ▶ **Medical**
- ▶ Other

RELATED CASES

2016-99M-0

▶ Real-time and continuous monitoring of specific molecules in undiluted whole blood

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,202,587	12/21/2021	2016-99M

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Drift-Free and Calibration-Free Measurement of Analytes
- ▶ Drift-Free, Self-Calibrated Interrogation Method For Electrochemical Sensors Based On Electron Transfer Kinetics
- ▶ Electronic Detection Of Molecular Targets, Including Proteins, Oligonucleotides And Other Small Molecules
- ▶ Fluorescent and Electrochemical DNA-Based Switches for Antibody Detection
- ▶ Electronic Detection Of Molecular Targets, Including Proteins, Oligonucleotides And Other Small Molecules

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