Electrochemical System and Method Thereof

Summary

An embodiment of the invention provides an ultrasensitive and selective system and method for detecting reactants of the chemical reaction catalyzed by an oxidoreductase, such as glucose and ethanol, at a concentration level down to zepto molar (10^{-21} M).

Additional embodiments of the invention provide an amperometry/voltammetry system including an electric field generator; and a selective and ultrasensitive method using the system for detection of chemical reactants at extremely low concentrations and increased processing times.

The present invention can be widely used in industrial and academic applications. Including sensing of ultra-low concentration of harmful molecules across food types, detection of small number of disease molecules in a patient's body fluid, and monitoring change of certain reactants in chemical reactions. The invention has direct applications in homeland security, early detection of diseases, and environment protection.

Listeria Bacteria   *Getty Images*

IP Status

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Applications

- Pathogen detection
- Infection detection
- Cancer detection
- Food safety testing
- Early disease detection
- Homeland security

Advantages

- Significantly faster detection (no culture) at low concentration levels (single cells).

- Detection of biomarkers at the femto gram/mL level.

- Disposable and inexpensive tests.

- Point-of-care applications.

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