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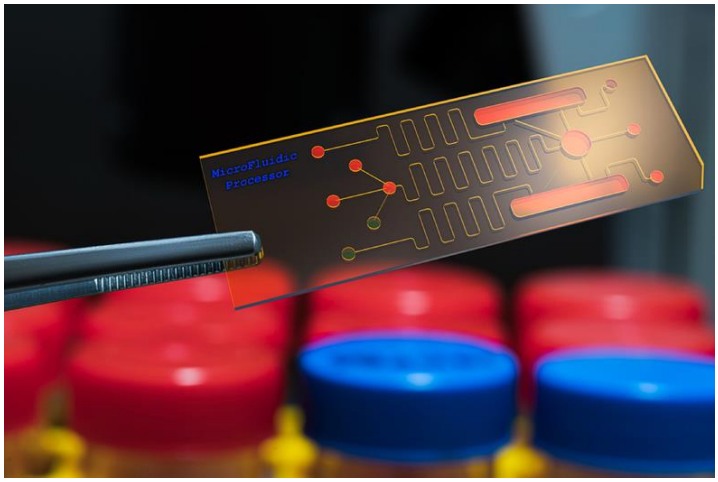
IMPEDIMETRIC BIOSENSOR



KEY INFORMATION

TECHNOLOGY CATEGORY:
Healthcare – Molecular Sensing Platform
Electronics - Sensors & Instrumentation

TECHNOLOGY READINESS LEVEL : TRL 3
COUNTRY: SINGAPORE
ID NUMBER: MT-MSP-001

Patents: A Nanogap Biosensing Electrode Design, SG Provisional Application filed, 10202300557R, 2023.
Know-How: Off surface matrix for on-chip electrochemical ELISA, IME Know How PAT14-052/BEP-005, 2017.
Publication: Multi-Cell Array of Nanogap Electrodes for Label-free Detection of Biomolecules, IEEE ECTC ’23.

OVERVIEW

There is an increasing demand for self-testing kits. The requirements come from diverse population of the society for various applications such as infectious disease detection, pregnancy testing, ovulation tracking, etc. The reliable self-testing kits ensure early detection of the disease and reduces anxiety. Conventionally, laboratory-based ELISA testing comes with significant downsides due to longer waiting time and cost per use. Thus, it creates a need for the point-of-care technology or user-friendly self-testing kits.

The molecular sensing platform developed by one stop solution for detecting multi-biomarkers on the same device. The solution is also integrated with readout circuit with LED display. The solution utilizes biological activity for its intended application and does not require measurement of the static environment in advance.

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TECHNOLOGY FEATURES & SPECIFICATIONS

The technology consists of a molecular sensing platform and reader for detection of multi-specimen biomolecules for various clinical applications.

- The device provides rapid results (< 3 mins)
- The device provides a resolution of femto molar detection range
- The device requires an analyte volume of <20 µL
- The solution provides quantitative analysis of the bio-specimen as a replacement for conventional ELISA
- The solution is a label-free and muti-specimen biomarker detection
- The device is cost-effective

POTENTIAL APPLICATIONS

The applications include but are not limited to:

- Infectious disease detection (influenza virus, dengue virus, SARS CoViD, etc.)
- Pregnancy detection
- Ovulation tracking
- Wound healing tracking
- Quantification of severity of cancer
- Water sample analysis
- Early Dementia detection using Amyloid Beta (Aβ) biomarkers

UNIQUE VALUE PROPOSITION

- The technology offers a non-invasive and a fast and convenient method of detecting the biomolecule of interest.
- The competitive technology utilizes nanoparticles-based tagging for detection which increases the sample preparation time.
- The multi-purpose molecular sensing platform can be customized for various applications by changing the aptamer based on the target molecule of interest.
- The form factor of the device technology is easy to use.
- The cost of the device can be cheaper than existing devices.

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