

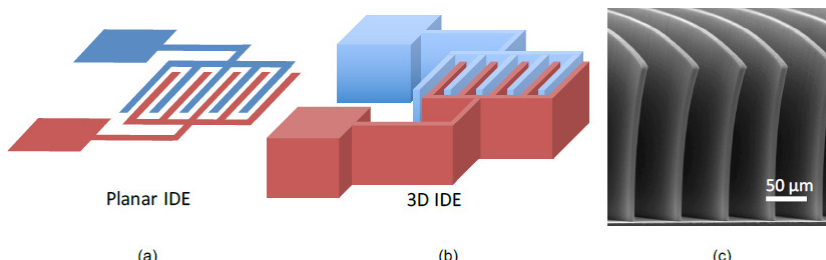


New Test for Early Cancer Detection

BYU #2017-024

DESCRIPTION

The invention consists of a 3D interdigitated electrode (IDE) sensor using carbon nanotube templated manufacturing (CNT-M) for highly sensitive, rapid, and point-of-care sensing. Electrochemical sensors are able to measure the concentration of chemicals or biological samples by applying a voltage difference and observing the electrical response. The target sample interacts with the surface of the sensor in such a way that the concentration of the chemical can be determined. Carbon nanotubes were used to construct a sensor with a large surface area in a small space, thus enhancing the overall detection capabilities of the sensor while reducing the volume of required sample.



(a) Schematics of planar, interdigitated electrodes (IDE) and (b) the proposed 3D IDE geometry constructed using carbon nanotube scaffolds to achieve high aspect ratio, porous electrodes. (c) Photolithographically defined CNT ribs comprised of CNT forests constructed by our group for other work.

PROBLEM SOLVED

With the ability to detect low concentrations, the sensor gives access to information that would otherwise be unavailable. Early stage detection of disease becomes possible by being able to measure the low concentration inherent in early disease development leading to early medical care. It also allows for simple point-of-care detection instead of requiring samples to be shipped and analyzed at a dedicated laboratory, enabling quick results of low concentration measurements.

KEY ADVANTAGES

- » *Low concentration detection (early detection)*
- » *Point-of-care results (bed-side or pen-side)*
- » *Small sample volumes*

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APPLICATIONS

Main healthcare applications: 1) rapid field detection of MRSA (antibiotic resistant bacteria) and 2) cancer screening tests via saliva collected during a routine dentist office. Other potential applications include glucose sensing, detection of specific biological species and detection of paratuberculosis.

IP Status:
Patent Pending



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