Novel Nanowire Field-Effect Transistor Biosensor With Superb Sensitivity

Tech ID: 22120 / UC Case 2011-117-0

SUMMARY

Researchers at UCLA have developed a highly sensitive, real-time, and label-free chemical and biomedical sensor in conventional silicon nanowire Field Effect Transistors (nw-FET), utilizing a built-in signal amplification mechanism to significantly improve detection sensitivity.

BACKGROUND

There has been an increasing demand for highly sensitive bio- and chemical sensor devices. Optical and MEMS methods provide highly specific platforms; however, problems of scalability and cost have hindered their employability in real field applications. With the recent advancements in nanotechnology, integrated systems have been developed through the use of silicon nw-FETs. However, the low level of output signal in the design of these sensors limit their potential applications.

INNOVATION

Researchers at UCLA have developed a novel, highly-sensitive integrated biochemical sensor with significant detection performance. Through integrating a sensing nanowire with a nw-FET channel, a built-in signal amplification mechanism is introduced, which greatly enhances detection sensitivity. Additionally, because the technology is compatible with conventional silicon fabrication techniques, it provides a simple and low-cost solution to integrated biomedical and chemical sensors.

APPLICATIONS

Chemical/Biomedical sensors

- Toxin detection, Disease diagnosis, Drug screening, Label-free biosensing (proteins, DNA, enzymes), Environmental monitoring

ADVANTAGES

- Standard semiconductor processing methods
- Tunable electronic properties

STATE OF DEVELOPMENT

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9645135	05/09/2017	2011-117

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- PCR-Free Ultrasensitive Hiv And Other Virus Quantitation Device

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OTHER INFORMATION

KEYWORDS

Nanowire FET, Chemical sensor, Biomedical Sensor, Silicon On Insulator (SOI), Schottky barrier

CATEGORIZED AS

- **Nanotechnology**
  - NanoBio
- **Sensors & Instrumentation**
  - Biosensors

RELATED CASES

2011-117-0

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