



TECH TO BUSINESS

CONTACT: Nima Najand • 403.775.1855 • [ipm@innovatecalgary.com](mailto:ipm@innovatecalgary.com)

## TLR-4-Based Bacterial Sensor

TECH ID #: 284.21

### Background

Researchers at the University of Calgary have developed a **novel electrical sensor capable of detecting Gram-negative bacteria in blood at concentrations as low as 1 cell/ml** while showing no response to Gram-positive cells or viruses.

The new sensor utilizes the specificity of the TLR-4 receptor for lipopolysaccharides (LPS) and the rapid and sensitive readouts associated with electrochemical devices. A number of groups have been working on developing a TLR-4-based electrochemical sensor to detect LPS with varying degrees of success. Researchers at the University of Calgary have improved the previous designs and developed a reproducible sensor capable of detecting both purified LPS and bacterial cells. The sensor consists of a self-assembled monolayer with optimized spacing and orientation of the biological components.

The sensitivity of the sensor allows it to be used as a rapid means of diagnosing sepsis – especially in infants where the symptoms of sepsis are similar to many other conditions. It can also be used to identify bacterial contamination of water samples or food.

### Areas of Application

- Sensitive and rapid identification of sepsis
- Environmental and water testing
- Food testing
- Sterility testing

### Competitive Advantages

- Fast and sensitive
- Reproducible
- Highly specific

### Stage of Development

- Sensor production has been optimized
- Currently testing sensor response on human sepsis samples

# TECHNOLOGY



## Intellectual Property Status

Provisional patent application filed