



Real Time Bacterial Water Sensors

OTT1225

Applications

Ultra-sensitive detection of *E. coli* cells for chemical sensors and biosensors.

Target Problems

E. coli O157:H7 is highly virulent and can cause infection at very low concentrations. Current monitoring methods for food production and water systems, including culturing, polymerase chain reaction, and immunological techniques, can be time-consuming and may have limitations in sensitivity and specificity.

Solution

This technology provides a graphene-based field-effect transistor (FET) immunosensor for highly sensitive detection of *E. coli* O157:H7. The solution enables rapid, real-time monitoring with detection of bacterial concentrations as low as 10 CFU per milliliter, supporting scalable production and deployment in water systems.

Key Benefits

- Real-time environmental monitoring capability
- Detects *E. coli* concentrations as low as 10 CFU/mL
- Fabrication process is scalable with good reproducibility
- High electrical stability
- Uses relatively inexpensive materials
- Can be placed directly in water systems for in-situ detection

About this Technology

The technology uses self-assembled thermally reduced monolayer graphene oxide (TRMGO) nanosheets on photolithographically patterned gold electrodes. The resulting graphene oxide FET sensor detects *E. coli* O157:H7 with high sensitivity, short response times, and high reproducibility.

Stage of Development

The inventors have demonstrated detection of *E. coli* O157:H7 at concentrations as low as 10 CFU/mL and reported high sensitivity, rapid response, reproducibility, and electronic stability. A solution-based fabrication process suitable for mass production has also been demonstrated.

Partnering Opportunity

This invention is seeking partners. This invention is looking for partner apps with water monitoring, biosensor, environmental sensing, and diagnostic technology companies.

Intellectual Property

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