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Concentration and Recovery of Viable Microbial Cells

A new biochip and method offer sensitive, real-time pathogen detection in food, extending equipment life and significantly reducing food safety testing costs.

In the U.S. alone, manufacturers spend $2.9 billion each year on food safety tests. Despite significant advances in food safety technologies, foodborne illnesses are more prevalent than ever. The Centers for Disease Control and Prevention (CDC) estimates each year about 48 million Americans are affected by foodborne illness, 128,000 are hospitalized, and 3,000 die. The detection of pathogens to prevent foodborne illness must be improved. There is an urgent demand for sensitive, rapid, cost-effective, widely translatable technologies to immobilize active bacteriophages that lead to foodborne illness.

Purdue University researchers have developed a biochip that detects pathogens in foods in real time and a method for using and maintaining the device. Cells are first concentrated. Then, the device can be put in the cell recovery mode to collect the retentate. The researchers developed a novel method for collecting the retentate so that the microbes can be analyzed. Accompanying software controls the unit's operation and allows for simultaneous filtration and cell recovery. The researchers have also developed a method for cleaning and sterilizing the instrument to allow reuse and address membrane fouling, which is the build-up of lipids, proteins, and other particles that block the membrane so fluid cannot flow through. Both developments will reduce costs associated with pathogen detection by extending the life of the equipment.

Advantages:

-Detects pathogens in real time

-Solves membrane fouling

-Extends equipment life

Technology ID

66024

Category

Agriculture, Nutrition, & AgTech/Food Safety & Traceability

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

Authors

Michael R Ladisch

Xuan Li

Hunter Vibbert

Eduardo Ximenes

Further information

Aaron Taggart

adtaggart@prf.org

View online

-Reduced costs

Potential Applications:

-Food Industry

-Food Safety

TRL: 5

Intellectual Property:

Provisional-Patent, 2012-03-28, United States | Provisional-Patent, 2012-11-29, United States | PCT-Patent, 2013-03-28, WO | NATL-Patent, 2013-03-28, European Patent | NATL-Patent, 2013-03-28, Canada | EP-Patent, 2013-03-28, United Kingdom | EP-Patent, 2013-03-28, France | EP-Patent, 2013-03-28, Germany | NATL-Patent, 2014-09-26, United States | CON-Patent, 2017-04-12, United States

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