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Multi-layer Bioassay for Analyte Immobilization and Labeling

A portable, low-cost system using laser-exposed absorbent strips rapidly detects 15 or more biological and chemical contaminants in a sample without extensive preparation.

Rapid detection of biological and chemical hazards is of upmost importance to USDA, EPA, and DoD. Likewise, companies within the food and life sciences industry are constantly concerned with contaminant detection in products. The current standard for detecting biological analytes is by the CyTOF method. In this method, samples are collected, then mixed with metal conjugated antibodies, and finally loaded into a mass cytometer. Once inside the cytometer, the metal ionizes which allows the analyte-metal conjugated antibody complex to be detected. Whilst, this system is great at detecting multiple analytes, it has several disadvantages including: samples requiring time-consuming extensive preparation and the use of the cytometer, which is a large device costing $700,000. This has created an unfulfilled need for a portable system that can quickly analyze the contents of a sample.

Researchers at Purdue have developed an instrument that can rapidly detect 15 or more analytes in a sample at once. This instrument is a similar to CyTOF in that metal conjugated antibodies are used to detect analytes. In contrast, samples are loaded into an absorbent strip with no sample preparation needed. The strips are then exposed to a laser and results are available within 15 minutes of loading the sample. The major differentiator of this instrument to CyTOF is that it is 5 percent of the cost.

Advantages:

-Detect multiple analytes at once

-Rapid and portable

-Inexpensive

Potential Applications:

Technology ID

2019-ROBI-68413

Category

Agriculture, Nutrition, & AgTech/Food Safety & Traceability
GreenTech/Environmental Remediation & Pollution Control
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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View online

-Hazard detection

-Environmental sample analysis

TRL: 3

Intellectual Property:

Provisional-Patent, 2018-09-14, United States | NATL-Patent, 2019-09-13, Europe | PCT-Patent, 2019-09-13, WO | NATL-Patent, 2021-03-10, United States | NATL-Patent, N/A, Canada

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