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Heavy-Metal Antibody Tagging and Plasma-Based Multiplexed Detection and Identification of Pathogen Organisms

Heavy metal antibody tagging and plasma-based detection (MAPD) enables fast, sensitive, and highly multiplexed classification of multiple pathogenic organisms with minimal sample preparation.

Immunodetection in microbiology, biosafety, and biosurveillance is very important for detecting and identifying potentially harmful pathogens. Currently, there are many methods of immunodetection, including traditional optical labeling, such as fluorescence and phosphorescence, and more recent developments using antibody-immobilized bacteria or bacteria bound to microfluidic chips that have been developed to increase optical signals, but many of these techniques are designed to identify a particular type of bacteria and do not allow for multiplexing or simultaneous detection of multiple bacterial species.

Researchers at Purdue University have developed a method for simultaneous identification of multiple pathogenic organisms using heavy metal antibody tagging and plasma-based detection (MAPD). MAPD uses a traditional immuno-recognition approach, but is able to simultaneously detect and identify the presence of multiple antigens without requiring multiple, time-consuming experiments performed in parallel. This method offers fast and sensitive pathogen detection with minimal sample processing and preparation. The use of heavy metal tags generates a very low signal background, which allows MAPD to be used on a large subset of molecular targets that can be combined in a simple, low cost manner.

Advantages:

-Highly multiplexed classification of pathogens

-Fast, sensitive detection with minimal sample processing and preparation

-Low numbers of molecules of the target antibody can be measured

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Category

Biotechnology & Life Sciences/Biomarker Discovery & Diagnostics

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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Potential Applications:

-Microbiology

-Biosafety

-Biosurveillance

TRL: 3

Intellectual Property:

Provisional-Patent, 2014-09-12, United States | PCT-Patent, 2015-09-14, WO | CIP-Patent, 2016-02-12, United States | NATL-Patent, 2017-03-10, European Patent | NATL-Patent, 2017-03-10, United States | DIV-Patent, 2019-10-16, United States | DIV-Gov. Funding, 2019-12-20, United States | EP-Patent, N/A, United Kingdom | CIP-Patent, N/A, United States | EP-Patent, N/A, France | EP-Patent, N/A, Ireland | EP-Patent, N/A, Germany

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