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Software Package for Control of BARDOT Hardware as well as Classification and Analysis of Scatter Patterns

Automated optical scattering technology rapidly detects and identifies bacterial species, eliminating the need for expensive and time-consuming equipment like PCR instruments.

Researchers at Purdue University have developed new hardware and software upgrades to fully automate the BARDOT (BActeria Rapid Detection using Optical scattering Technology) platform. BARDOT is a technique in which a laser is directed at a bacterial colony, and the reflected scattered light is detected. Various properties of the bacteria will cause changes in the recorded scatter pattern. The upgrades for BARDOT developed by Purdue significantly reduce the time needed to detect and identify bacteria. Moreover, the new system

provides automatic detection and identification to determine the species of bacterial colony under investigation without the need for expensive and time-consuming equipment such as PCR instruments.

Technology Validation:

Segmentation and region growing algorithms and two-dimensional centering algorithms using a centroid difference of scattering pattern were tested on BARDOT. Results demonstrated that a linear relationship can be constructed between the XY stage displacement and centroid difference which will provide minimum number of fine adjustments to capture the centered scattering pattern.

Publication:

Euiwon Bae, Andry Lesmana, Arun K. Bhunia, J. Paul Robinson, E. Daniel Hirleman, "Development and optimization of two-dimensional centering algorithm for bacterial rapid detection system using forward scattering," Proc. SPIE 6849, Design and Quality for Biomedical Technologies, 684905 (12 February 2008); https://doi.org/10.1117/12.763478

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Category

Agriculture, Nutrition, & AgTech/Food Safety & Traceability
Biotechnology & Life Sciences/Biomarker Discovery & Diagnostics
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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Advantages:

-Performs automated classification and identification of organisms

-Rapid identification

Applications:

-Food, Water, and Pharmaceutical Manufacturing Safety Monitoring

-Clinical Diagnostics

-Research

-Bacteria and Pathogen Detection

TRL: 3

Intellectual Property:

Keywords: BARDOT, Bacterial Rapid Detection, Optical scattering Technology, Automated bacterial identification, Rapid identification of bacteria, Pathogen detection system, Microbial detection, Clinical Diagnostics, Food safety monitoring, Pharmaceutical safety monitoring, Biotechnology, Computer Technology, Laser based detection, microorganism detection, Pathogen classification