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Combination Image and Scatter Analysis of Colonies

This enhanced imaging technology combines traditional laser light scatter with full colony images to rapidly identify very small microbial and non-microbial cell colonies, supporting applications in diagnostics, drug development, and food safety.

Currently, for the identification of bacterial colonies, techniques have been developed using laser light scatter, which creates patterns or fingerprints that can be classified and used to identify the microorganisms. However, very small colonies are hard to identify and some colonies are not organized in a structured fashion, like bacteria; therefore, there is a need to have enhanced imaging other than just a laser scatter.

To solve this issue, researchers at Purdue University have developed a technique that introduces an additional colony image by recording the entire colony image and associating it with a laser scatter pattern, which is later saved in a database where features can be extracted. This method of combining regular images of the entire macroscopic area of interest with the laser scatter fingerprint allows for the evaluation of very small colonies (less than 150 microns) or for cell systems other than microbial colonies. This technology is used in conjunction with current laser scatter techniques, adding only one second per colony to the current method. Different colored light sources can be used to collect reflected or back-scattered light from which additional information can be deduced regarding the colonies. Using the image camera, non-microbial populations, such as stem cells, fibroblast colonies, and other cell colonies, can be segmented and the image processed to identify appropriate or reduced to phenotypically useful groups.

Advantages:

-Additional images used

-Enhanced imaging of colonies

-Non-microbial species identified

Technology ID

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Category

Agriculture, Nutrition, & AgTech/Food Safety & Traceability

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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Potential Applications:

-Medical/Health

-Diagnostics

-Drug development

-Clinical trials

-Food safety

TRL: 5

Intellectual Property:

Provisional-Patent, 2015-04-21, United States | PCT-Patent, 2016-04-21, WO | NATL-Patent, 2017-10-09, United States | NATL-Patent, 2017-10-18, Europe | CON-Gov. Funding, 2020-06-12, United States | CON-Gov. Funding, 2022-01-18, United States

Keywords: laser light scatter, bacterial colonies identification, enhanced imaging, macroscopic colony image, laser scatter fingerprint, very small colonies evaluation, non-microbial populations, stem cells identification, fibroblast colonies, cell colony identification, Bacterial Identification, Classification Technology, Food Safety, Lasers, Medical/Health