



New Gradient-Based Cell Labeling Method Maintains Location Information During Downstream Analysis

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a new technique for labeling cells on two-dimensional surfaces so that their location relative to other cells can be determined after they are removed from the surface.

Overview

Cellular ecology is a major factor in processes like cell signaling and transport as well as in the development and progression of systemic diseases like cancer. *In situ*, *in vitro* studies are becoming more common as researchers seek to understand how cells respond to the physical and molecular signals within their diverse microenvironments.

However, downstream analysis tools such as single-cell PCR and flow cytometry require removing cells from their *in situ* location so that information about their position and history within a culture is lost. Other techniques that use image-based analyses can be used to track position information but are low throughput, computationally intensive and require continuous monitoring.

The Invention

UW–Madison researchers have developed a new device and method for tagging and monitoring individual cells in a microenvironment.

Concentrated dye solution is placed within molded wells inside a gel, diffusing throughout to form a color-based gradient. This stamp is then placed over the cell culture to be studied, allowing the dye particles to diffuse into the culture and label the cells. When the cells are removed from their environment for further analysis, the technique allows them to be easily identified and their previous location to be tracked.

Applications

- Biological research and cell-based assays
- Disease and cellular ecology
- Cell signaling

Key Benefits

- Enhances cell identification and cell-history recognition
- Improves cell migration mapping
- Facilitates deep characterization of cellular heterogeneity
- Enables analysis of cells in their original location

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Additional Information

For More Information About the Inventors

- [David Beebe](#)

Related Technologies

- [For more information about gradient-based assays and microfluidics in cellular environments, see WARF reference numbers:](#)
- [P08041US](#)
- [P05144US](#)
- [P04153US](#)
- [P01417US](#)

Publications

- Moussavi-Harami S. F., Pezzi H. M., Huttenlocher A. and Beebe D. J. 2015. Simple Microfluidic Device for Studying Chemotaxis in Response to Dual Gradients. Biomed Microdevices. 17, 51.
- Berthier E. and Beebe D. J. 2014. Gradient Generation Platforms: New Directions for an Established Microfluidic Technology. Lab Chip. 14, 3241-3247.

Tech Fields

- [Analytical Instrumentation, Methods & Materials : Microfluidics](#)

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846

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