



Population-Averaged Method to Quantify Cell Motility and Migration

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of quantifying cell motility and migration.

Overview

Cell motility and migration are involved in a range of biological processes, from embryo development to cancer metastasis. Although many methods have been developed to study cell movement, current techniques are labor intensive and provide limited quantitative information.

Because most migrating cells rely on a chemical gradient to orient their movements, flow-based microfluidic systems have been designed to generate well defined gradients to study the migration of blood, tumor and neural cells; however, these systems rely on video microscopy for readout, which limits throughput and requires expensive software for data analysis. In addition, the flow may wash away cell signaling components.

The Invention

UW-Madison researchers have developed an alternative, microtechnology-based method for conducting cell mobility assays. This technique combines microfluidic gradient generation with micro-patterning to simplify the extraction of important migratory information. Rather than tracking individual cells, it uses parameters from the cell population as a whole.

A population of cells is labeled (e.g., with fluorescent dye) and patterned within a microchannel network so the cells are uniformly dispersed along the channel in the form of a generally rectangular strip. A predetermined medium that includes a migration- or motility-promoting signal is patterned along one sidewall of the channel. Then a first image of the population is obtained. After a predetermined time period, a second image is obtained and compared to the first. Simple mathematical processing of the images yields quantitative measurements that can be used to calculate the average directional migration and motility of the cell population.

Applications

- Analyzing cell motility and migration

Key Benefits

- Allows the user to simply and easily determine quantitative motility and directional migration data for a cell population
- Multiple populations of cells can be compared.
- Data is averaged across the population, improving sensitivity.
- Compatible with robotic micropipetting stations
- Amenable to high throughput operation

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- Requires only phase contrast or fluorescence microscopy for readout

Additional Information

For More Information About the Inventors

- [David Beebe](#)

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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