MICROFLUIDIC FLOW LYSOMETER DEVICE, SYSTEM AND METHOD

Tech ID: 19443 / UC Case 2009-113-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,304,245	11/06/2012	2009-113

BRIEF DESCRIPTION

Single-cell analysis has generated a wealth of information in cell population studies. The characteristics of cells in a heterogeneous population can be analyzed without the loss of information that would result from averaging the population as a whole.

Until now, most single-cell analysis has been focused on the surface properties since limited markers exist that can penetrate the plasma membrane into the cytosol and allow measurement of the cellular contents in single cells. Most cytosolic components can only be measured after disruption of the plasma membrane and report on the composition of the population as a whole rather than on individual cells in a heterogeneous cell population.

Using a multi-disciplinary approach, combining biomedical science and nanotechnology developed by micromechanical engineering, the Microfluidics Flow Lysometer (MFL) team is developing a novel technique, flow-lysometry, which measures cytosolic components of single cells.

The team envisions that this technology can be applied to various types of cells measuring many different cytosolic components including antibodies, RNA levels and enzyme production.

The flow-lysometry technology when combined with commercially available flowcytometer capabilities will be capable of correlating individual cell morphology and surface characteristics with the cell's internal biochemistry.

Flow cytometry is currently used in numerous applications in basic research, clinical research, drug discovery and clinical diagnostics testing. With the extension of flow-lysometry, this proprietary technology provides a more robust cell analysis capability.

APPLICATIONS

» enable personalized medicine for cells, for example, to quantify the level of a drug inside a cell for a heterogeneous population that has previously been pre-sorted based on a surface marker.

» full spectrum of high and low levels could be identified providing, powerful data for pharmacokinetic-pharmacodynamics (PKPD) analysis.

» as an add-on component or a stand-alone system.

CONTACT

Michael Cohen
mcohen@berkeley.edu
tel: 510-643-4218.

INVENTORS

» Kuypers, Frans

» Lee, Won Chul

» Pisano, Albert P.

OTHER INFORMATION

CATEGORIZED AS

» **Research Tools**

» Screening Assays

» **Sensors & Instrumentation**

» Medical

» Scientific/Research

RELATED CASES

2009-113-0

» to develop countless new assays benefiting from the dual surface and intracellular recognition capabilities.

» provide significant development acceleration.

ADVANTAGES

» significantly smaller samples sizes could be utilized.

» the small sample size requirement combined with robust “distribution” information could provide better clinical data leading to faster clinical trials.

» addresses issues such as cell pre-screening, device fouling, correction for experimental artifacts (incomplete cell lysis, variable cell debris volume dilution effects) and adequate analytical capability.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Pyroelectric MEMS Infrared Sensor with Numerous Wavelength Absorptions
- Microfluidic Reagent Delivery System By Hydrogel Dehydration Through A Porous Encapsulant

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University of California, Berkeley Office of Technology Licensing
2150 Shattuck Avenue, Suite 510, Berkeley,CA 94704
Tel: 510.643.7201 | Fax: 510.642.4566
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