

AUTOMATED TWO-DIMENSIONAL ELECTROPHORESIS IN MICROFLUIDIC CHAMBER

Tech ID: 21766 / UC Case 2011-169-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,671,368	06/06/2017	2011-169

BRIEF DESCRIPTION

Knowledge of a biological system's proteome, the set and level of proteins it produces, is essential for understanding its physiological properties and for medical diagnosis of many diseases. Current methods used to identify proteins and measure their quantity involve physical separation of the proteins present in a sample, based on a single characteristic property such as their size or charge. These one-dimensional techniques have several limitations, for example protein size separation techniques do not distinguish different isoforms of the same protein, which can have very different structures and functions despite being the same size.

Scientists at UC Berkeley have developed a novel two-dimensional protein separation technique, which separates proteins in a 2D-microfluidic platform by both their size and their charge. Using two separation modes in this way enables protein identification with a higher specificity and better spatial separation resolution compared to one-dimensional techniques. In addition, the microfluidic platform can be optimized for a given sample by fine-tuning the separation parameters and reagents. The platform is compatible with many different read-out modalities, including mass-spectrometry or introduction of labeling reagents such as antibodies or fluorophores. The advantages provided by two-dimensional protein separation in this way will innovate proteomic research and medical diagnostics.

SUGGESTED USES

- » Proteomic instruments for commercial and research uses
- » Drug development
- » Vaccine development
- » Clinical diagnostics

ADVANTAGES

- » Increased specificity and spatial resolution of protein separation relative to one-dimensional techniques

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Proteomics, Protein separation,
Microfluidics, Electrophoresis

CATEGORIZED AS

- » **Biotechnology**
 - » Proteomics
- » **Materials & Chemicals**
 - » Biological
- » **Medical**
 - » Diagnostics
- » **Research Tools**
 - » Other
- » **Engineering**
 - » Other

RELATED CASES

2011-169-0

- » Less labor intensive, higher reproducibility, lower reagent consumption and faster assay times compared to current two-dimensional separation techniques
- » Parameters and reagents can be optimized for desired function
- » Automated and straightforward to operate

PUBLICATION

[Microchamber integration unifies distinct separation modes for two-dimensional electrophoresis](#)

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Simultaneous Detection Of Protein Isoforms And Nucleic Acids From Low Starting Cell Numbers](#)
- ▶ [Microfluidic Chip For Rapid Multi-Analyte Detection](#)
- ▶ [Dropblot Design Integrates Droplet Microfluidics With Single-Cell Electrophoresis](#)
- ▶ [Single-Cell Isoelectric Focusing and pH Gradient Arrays](#)



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