SINGLE-CELL ISOELECTRIC FOCUSING AND PH GRADIENT ARRAYS

Tech ID: 25107 / UC Case 2015-192-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,768,141	09/08/2020	2015-192

BRIEF DESCRIPTION

Post-translational protein modifications, such as glycosylation or phosphorylation, are the level at which this heterogeneity is expressed, and may serve as disease biomarkers. These modifications only result in small molecular mass changes, meaning that standard size-based separation techniques cannot be used. Isoelectric focusing (IEF) is a powerful technique that can resolve a single electrostatic charge difference between protein isoforms, and can be used for the charge-based separation post-translationally modified proteins require. Multiplexed IEF separations are challenging due to the unique chemical environment needed. Although IEF would be ideal for single-cell protein measurement, current techniques rely on specific antibodies to resolve different isoforms, limiting the assays in scope.

Researchers at UC Berkeley have addressed these issues by developing a single-cell isoelectric focusing technique that uses pH gradient arrays. By multiplexing IEF, this technology enables separation of the contents of single cells to get insights into cell heterogeneity while retaining the analytical performance to resolve small charge differences.

SUGGESTED USES

- Drug and vaccine development
- Clinical diagnostics development and manufacturing
- Proteomic instrument for commercial and research life science investigations

ADVANTAGES

- Highly-multiplexed isoelectric focusing separations
- High-throughput
- Can be used for multiple sample types
- Straightforward electrical interfacing
- Sample loading can be automated

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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INVENTORS

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OTHER INFORMATION

KEYWORDS

IEF, Single-cell, multiplexed, protein, modification, ubiquitination, truncation, phosphorylation, glycosylation, isoelectric focusing, pH gradient

CATEGORIZED AS

- **Biotechnology**
  - Proteomics
- **Medical**
  - Diagnostics
  - Research Tools
- **Research Tools**
  - Other

RELATED CASES

2015-192-0

- Simultaneous Detection Of Protein Isoforms And Nucleic Acids From Low Starting Cell Numbers
- Automated Two-Dimensional Electrophoresis In Microfluidic Chamber
- Microfluidic Chip For Rapid Multi-Analyte Detection
- Dropblot Design Integrates Droplet Microfluidics With Single-Cell Electrophoresis

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