

# SCITO-SEQ: SINGLE CELL COMBINATORIAL INDEXED CYTOMETRY SEQUENCING

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## INVENTION NOVELTY

Researchers at UCSF have developed SCITO-seq, a new workflow for single cell sequencing-based proteomics.

## VALUE PROPOSITION

- ▶ Sequencing-based proteomics can read out all antibody-derived tags with one reaction, at low sequencing depths
- ▶ All cell surface proteins with available antibodies can be targeted
- ▶ As the number of pools increases, total library and DNA-barcoded antibody construction costs drop, while the number of cells recovered increases
- ▶ Antibody-stained cell loading is tunable to the desired collision rate
- ▶ Amenable to simultaneous multimodal profiling of transcripts or chromatin accessibility

## TECHNOLOGY DESCRIPTION

The use of DNA to barcode and tag antibodies has created new opportunities to use sequencing to profile the molecular properties of thousands of cells simultaneously. Furthermore, DNA-barcoded antibodies coupled with advances in microfluidics have enabled droplet-based single cell sequencing (dsc-seq) to profile the surface proteomes of cells. The major limitation of current dsc-seq workflows is the high cost associated with profiling each cell, precluding its use in applications where thousands or millions of cells are required.

## APPLICATION

Cost-effective two-step single-cell combinatorial indexing (SCI) for cellular composition profiling and analysis by dsc-seq

## STAGE OF DEVELOPMENT

The inventors introduce SCITO-seq, a single cell proteomics workflow that combines split-pool indexing and commercially available dsc-seq to enable cost-effective profiling of cell surface proteins, scalable to  $10^5$ - $10^6$  cells. SCITO-seq utilizes advances in droplet-based microfluidics for combinatorial indexing of antibody-derived pool and droplet barcodes to reduce library construction and sequencing costs. Protein expression profiles for cells simultaneously encapsulated in a single drop are resolved by the combinatorial index of pool and droplet barcodes. The inventors demonstrate the feasibility and scalability of SCITO-seq in mixed species experiments and by profiling peripheral blood mononuclear cells using a panel of 28 antibodies in one microfluidic

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### OTHER INFORMATION

#### KEYWORDS

single cell, single cell analysis, dsc-seq, proteomics, droplet-based single cell sequencing, microfluidics, antibody

#### CATEGORIZED AS

- ▶ Medical
- ▶ Research Tools

#### RELATED CASES

2020-186-0

reaction.

RELATED MATERIALS

► [SCITO-seq: single-cell combinatorial indexed cytometry sequencing](#) - 08/05/2021

PATENT STATUS

Patent Pending

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