SELECTIVE MAGNETIC SEPARATION OF MICROCOMPARTMENTS CONTAINING CELLS AND MOLECULES

Tech ID: 33635 / UC Case 2024-163-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

Efficiently isolating specific biological components from complex mixtures is a cornerstone of modern biotechnology. UC Berkeley researchers have developed a robust method for the selective magnetic separation of target cells and molecules contained within microcompartments, allowing for the rapid isolation and recovery of high-purity biological samples. This approach is particularly effective for high-throughput screening and the analysis of rare cellular populations.

SUGGESTED USES

» Single-Cell Analysis: Enabling the isolation of individual rare cells from clinical samples, such as circulating tumor cells in blood, for detailed genomic sequencing.

» Drug Discovery: Accelerating high-throughput screening by selectively recovering cells that exhibit specific biochemical responses to therapeutic candidates.

» Rare Molecule Recovery: Isolating low-abundance proteins or nucleic acids from complex environmental or clinical lysates for downstream diagnostic testing.

» Synthetic Biology: Separating engineered microcompartments that have successfully produced a desired metabolic product from those that remain inactive.

» Point-of-Care Diagnostics: Powering portable devices that can rapidly detect and isolate specific pathogens from patient samples using minimal reagents.

ADVANTAGES

» High Purity and Recovery: The technology ensures that target materials are isolated with minimal contamination from non-target background elements.

» Gentle Separation: Magnetic force provides a non-invasive way to manipulate delicate biological entities, preserving the viability and native state of the isolated cells.

» Scalable Throughput: The use of microcompartments allows for the simultaneous processing of millions of individual samples, significantly reducing processing time compared to traditional methods.

» Versatile Target Range: The system can be adapted to isolate a wide variety of targets, from small molecules and proteins to entire living cells, by changing the magnetic labels.

» Integration Potential: This separation method can be easily integrated with other microfluidic or lab-on-a-chip technologies for fully automated "sample-to-answer" workflows.

RELATED MATERIALS

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OTHER INFORMATION

CATEGORIZED AS

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