

# A Low Cost and Low Powered Integrated Cell-Sorting Module

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## BACKGROUND

Over the past decade, the field of microfluidics has begun to show great promise for research assays and diagnostics as well as for clinical applications. The field has evolved from devices comprised of simple microfluidic channels into complex devices that can mix fluids, pump liquids, perform digital logic, etc. Flow cytometry provides the field with a technology base from which both microfluidic and photonic components can be developed and integrated into a useful device.

## TECHNOLOGY DESCRIPTION

UC San Diego researchers have invented a cell-sorting module that can be integrated with a flow-cytometry chip and system architecture for automated, closed-loop, cell detection and sorting. The invention provides a piezoelectrically actuated micro-sorter that operates at low power and low voltage and can deflect and sort single particles and cells at high speed. The micro-sorter can be added to existing microfluidic systems to perform cell sorting. To achieve closed-loop operation—with upstream fluorescence detection and downstream sorting—the invention provides algorithms for real-time signal processing and control. The invention presents, among others, the advantages of on-chip integration, automation with verification, low power operation, simple and low-cost fabrication, and small footprint.

## INTELLECTUAL PROPERTY INFO

This invention has a patent pending and is available for sponsored research and/or licensing.

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,324,018	06/18/2019	2009-139
United States Of America	Issued Patent	9,778,164	10/03/2017	2009-139
United States Of America	Issued Patent	9,645,010	05/09/2017	2009-139
United States Of America	Issued Patent	9,134,221	09/15/2015	2009-139
United States Of America	Published Application	0064251 A1	02/27/2020	2009-139
United States Of America	Published Application			2009-139

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## OTHER INFORMATION

### KEYWORDS

microfluidics, flow cytometer, cell  
detection, cell sorting, micro-sorter,  
hydrodynamics, piezoelectric  
actuation

### CATEGORIZED AS

- **Medical**
- **Diagnostics**

### RELATED CASES

2009-139-0, 2010-144-1, 2010-145-1