

Lateral Cavity Acoustic Transducer As An On-Chip Cell/Particle Switch

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BRIEF DESCRIPTION

Microfluidic technologies have revolutionized the field of cell biology by enabling the development of integrated “lab on a chip” systems that are capable of integrating multiple laboratory steps onto a single device. An important cell manipulation process that has been the focus of microfluidic researchers is the ability to switch cells of interest to multiple downstream processes for further analysis. As a result, multiple microfluidic switches for particles and cells have been developed and integrated into micro Fluorescence Activated Cell Sorting (µFACS) systems, including electro-osmotic flow (EOF), dielectrophoresis, microfabricated valves, external valves, and optical tweezers. However, many of these current microfluidic switches have drawbacks such as low throughput, low cell recovery, complex off-chip setups, and high voltages. Novel microscale cell/particle sorting systems would be extremely useful components to integrate into next-generation microfluidic devices for cell biology applications.

Researchers at the University of California, Irvine have developed a novel Lateral Cavity Acoustic Transducer (LCAT) cell/ particle switch that is capable of deflecting cells and particles to downstream collection channels. The device is easily fabricated, can achieve switching rates up to 800 particles per second, achieves approximately 94% cell viability, has low energy consumption, and is suitable for integration into a complete microfluidic sorting platform.

SUGGESTED USES

The cell/particle switch may be integrated into microfluidic sorting platforms that are used in cell biology applications.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,517,465	12/13/2016	2012-262

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OTHER INFORMATION

KEYWORDS

Microfluidic, Cell switch, Particle switch, LCAT, Lateral cavity acoustic transducer, On-chip, Lab on a chip

CATEGORIZED AS

- » Engineering
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- » Research Tools
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