

Abstract Submitted  
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**Development of a Pressure Switched Microfluidic Cell Sorter**

BARIS OZBAY, ALEX JONES, EMILY GIBSON, Department of Physics, University of Colorado Denver — Lab on a chip technology allows for the replacement of traditional cell sorters with microfluidic devices which can be produced less expensively and are more compact. Additionally, the compact nature of microfluidic cell sorters may lead to the realization of their application in point-of-care medical devices. Though techniques have been demonstrated previously for sorting in microfluidic devices with optical or electro-osmotic switching, both of these techniques are expensive and more difficult to implement than pressure switching. This microfluidic cell sorter design also allows for easy integration with optical spectroscopy for identification of cell type. Our current microfluidic device was fabricated with polydimethylsiloxane (PDMS), a polymer that houses the channels, which is then chemically bonded to a glass slide. The flow of fluid through the device is controlled by pressure controllers, and the switching of the cells is accomplished with the use of a high performance pressure controller interfaced with a computer. The cells are fed through the channels with the use of hydrodynamic focusing techniques. Once the experimental setup is fully functional the objective will be to determine switching rates, explore techniques to optimize these rates, and experiment with sorting of other biomolecules including DNA.

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