

Abstract Submitted  
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**Cascade and staggered dielectrophoretic cell sorters** FANG YANG, XIAOMING YANG, HONG JIANG, GUIREN WANG, UNIVERSITY OF SOUTH CAROLINA TEAM, WJB DORN VETERANS AFFAIRS MEDICAL CENTER, COLUMBIA TEAM, GRACEFLOW TECHNOLOGY, IRMO, SC. TEAM — We report experimental results of successful separation of different cancer cells (breast and prostate) from colorectal cancer cells in Dielectrophoresis (DEP) in continuous operation. Conductivity influence on DEP spectrum for each cell type has been investigated. Under optimized condition, different cell type can be separated from each other. Enrichment factor and cell purity are measured to characterize the performance of the DEP chip. AC voltage and frequency effect on the separation is measured. In practical lab-on-a-chip application highly purified cell and high flow rate are required. In order to increase the purity of the isolated cells, cascade DEP sorter is developed. To increase flow rate, staggered DEP sorter is developed. It is found that compared with single DEP sorter, adding cascade DEP sorter can significantly increase the purity of the target cell. With the staggered chip, the flow rate can be increased without compromising enrichment factor.

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