A Hybrid Integrated-Circuit/Microfluidic Device for Positioning, Porating and Fusing Individual Cells

CASPAR FLORYAN, DAVID ISSADORE, ROBERT WESTERVELT
Harvard Univ — Here we report a hybrid integrated-circuit/microfluidic device which can position, porate and fuse individual cells. Existing electroporation and fusion devices can only act on cells in bulk. Our device consists of a microarray of electrode pixels and a grounded conducting plate. Cells were positioned with dielectrophoretic forces induced by the pixels and porated or fused with voltage pulses which caused a dielectric breakdown of the cell membrane. The device positioned cells with 10µm precision and porated or fused them with high yields. It is programmable and mass-parallelization on a single device enables bulk applications. ¹ T. Hunt, D. Issadore, R. Westervelt, Lab on a Chip, 2008, 8, 81-87.

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²Submitter