

Abstract Submitted
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Microfluidic cell electroporation using a mechanical valve CHANG LU, JUN WANG, M. JANE STINE, Purdue University, West Lafayette, IN, BIOLOGICAL ENGINEERING TEAM — A microfluidic electroporation technique is demonstrated based on the operation of an elastomeric valve in a polydimethylsiloxane (PDMS) fabricated microchip and a common dc power supply. The pulse needed for permeabilization of the cell membrane is generated by temporarily interrupting the circuit using the valve. The electropermeabilization of suspended and adherent Chinese hamster ovary cells with green DNA dye SYTOX is demonstrated. The technique eliminates the cost and complexity associated with a pulse generator and microfabricated electrodes that are often involved in microscale electroporation devices. It also offers the potential of integrating electroporation as a unit operation in large-scale microfluidic systems with the increasing application of elastomeric valves in these systems.

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