

Abstract Submitted  
for the DFD14 Meeting of  
The American Physical Society

**A high throughput droplet based electroporation system<sup>1</sup>**

BYEONGSUN YOO, MYUNGMO AHN, POSTECH, DOJIN IM, Pukyong National Univ., INSEOK KANG, POSTECH — Delivery of exogenous genetic materials across the cell membrane is a powerful and popular research tool for bioengineering. Among conventional non-viral DNA delivery methods, electroporation (EP) is one of the most widely used technologies and is a standard lab procedure in molecular biology. We developed a novel digital microfluidic electroporation system which has higher efficiency of transgene expression and better cell viability than that of conventional EP techniques. We present the successful performance of digital EP system for transformation of various cell lines by investigating effects of the EP conditions such as electric pulse voltage, number, and duration on the cell viability and transfection efficiency in comparison with a conventional bulk EP system. Through the numerical analysis, we have also calculated the electric field distribution around the cells precisely to verify the effect of the electric field on the high efficiency of the digital EP system. Furthermore, the parallelization of the EP processes has been developed to increase the transformation productivity.

<sup>1</sup>This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Science, ICT and Future Planning (Grant Number: 2013R1A1A2011956).

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Date submitted: 01 Aug 2014

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