A novel 3-dimensional microelectroporation system for efficient molecular delivery into Chlamydomonas reinhardtti

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Among the various transfection methods, Electroporation is widely used to introduce foreign molecules into cell because of its effectiveness and convenience. Although many researcher have studied transportation of foreign genetic molecule in to cell using conventional cuvette type electroporation system, lower cell viability has been regarded as main problem because high voltage should be applied to cell for efficient transfection. To overcome this problem, some researcher develop microelectroporation system based on MEMS using that shorter distance between electrodes facilitates higher transfection efficiency and cell viability. However, these fabrication processes based on MEMS are difficult and time, cost-consuming. In additionally, they cover only small amounts of cells because of very low height (~0.1mm) In this work, the new 3-dimensional microelectrode is fabricated using 3D printing technology to overcome conventional electroporation system and previous microelectroporation system. Using this system, higher molecular delivery efficiency and higher cellular viability in microalgae are achieved than conventional system.