Development of high voltage pulse inducement method for biological cell

Abstract

Electroporation (EP) system is a process of controlling cell functions by using electromagnetic fields (EMF) to create pores through a cellular membrane that causes cell lysis and apoptosis. In this paper we present an experimental setup for fundamental studies on cell EP. An adjustable high voltage pulse generator (3kV/10s-600s pulse length) system were connected to the EP chamber which subsequently allow real time observation of membrane permeability changes and cellular physiology. In order to initiate higher cell viability rate, high transfection efficiency, lower sample contamination and smaller Joule heating the modification of EP chamber need to be implemented Following that, HeLa cell culture has been projected as cell that will be used in this study. Finally, some suggestions are proposed for the future studies.