

EGBE 693 Research Seminar for Biomedical Engineering II

EGBE 691 Biomedical Engineering Seminar II

Date: January 24, 2014 Time: 11AM-12AM

**Department of Biomedical Engineering
Mahidol University (Room 6373)**



“Electromanipulation of cells”

**Wonphorn Kandhavivorn
Department of Chemical Engineering**

The investigation of an electric field, electromagnetism and ultrasonic wave on cell biology are of interest among many researchers. The electric field is employed on manipulating cell function such as cell growth inhibition and cell differentiation. Dielectrophoresis (DEP), which is one kind of electromanipulation, also uses for cell separation. Cells respond to an electric field because of the surface's charge and the electrical properties such as resistance, capacitance. That's why cells have electrical responses. Here in center of cell and tissue manipulation (CCTM), electric field has been used for manipulating cell. First is about the investigation of an electric field effect on cell adhesion. The utilization of the electrostatic charge on cell surface controls the ability of cell adhesion. Mouse fibroblast L929 was applied a pulse electric field to detach cell from conductive substrate. Second one is to control a cell differentiation and cell growth in breast cancer MDA-MB 231 with the electric field. In order to observe cell differentiation, Stimulated MDA-MB 231 was determined a cell adhesion, tube-like formation and cell invasion. Moreover, the effect of the pulse electric field on cell growth and death were also investigated.

The effect of electric field and electromagnetism on cell biology is still controversy. It seems to be more than cell death induction. What if an electric field and electromagnetism can control a cellular response? This question leads to the electrical signal detection. Cell on chip may answer this question. The electrical signal of cell may give us a clue that what cell is going to be, good cell or bad cell? Cell's chip may be the new tool for monitoring cell activity.



**Department of Biomedical Engineering
Faculty of Engineering**

Mahidol University

Wisdom of the Land

