

In cooperation with **Lebanese University, Faculty of Engineering, Tripoli**, Dr. Haitham Ziade

Tripoli, 30 January 2009

Development of a Electroporator device

For the new MEGBI Genetic Engineering Laboratory in Tripoli a Electroporator unit is required. With electroporation foreign DNA can be introduced into cells. A commercial electroporation device is very expensive. To save costs this device shall be developed with students of Lebanese University in cooperation with the German company TEMO.

Based on a already developed circuit and a research paper [Rodamporn et. al.]¹ the electrical platine shall be constructed and the microcontroller (a PIC 16F84) shall be programmed.

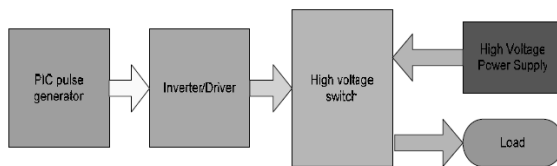


Figure 3 Block diagram of electroporation system

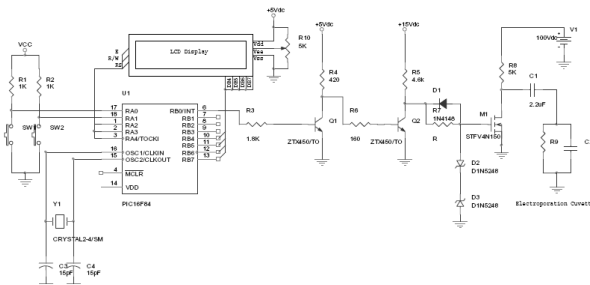


Figure 4 the schematic of an electroporation system

Already existing circuit [Rodamporn et. al.]

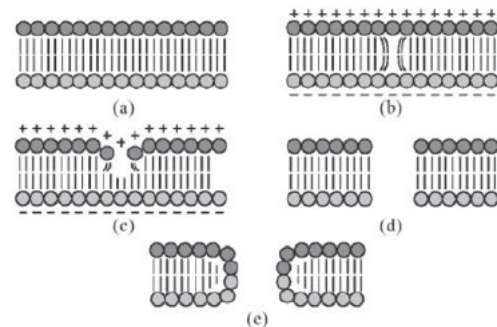


Figure 2 Process of pore formation (a) normal cell membrane, (b) a cell excited short electrical pulse resulting in irregular molecular structure (c) the membrane being method (d) the cell with a temporary hydrophobic pore and (e) the cell with a membrane restructuring [7]

The process of electroporation in the biological cell [Rodamporn et. al.]



Development tools: PIC microcontroller programmer (left), PIC evaluation board (middle) , oscilloscope

Supervisors:

Dipl.-Ing. Dipl.-Inf. Samir Mourad, TEMO, Tel. 70 196048, email: samir.mourad@temo-ek.de

Dr. Haitham Ziade, Lebanese University, Faculty of Engineering, Tel. 03 43124, hziade@ul.edu.lb

¹ Design and Construction of a Programmable Electroporation system for Biological Applications, Rodamporn, S1, Beeby, S.P1, Harris, N.R., Brown, A.D1 and Chad, J.E, Proceedings of the ThaiBME 2007