Software lab project

Modeling in vitro electrical stimulation of biological cells

Project description:

Many biological cells can sense electric field (EF) and change their behaviour in response to the applied electrical stimulation. Outside their natural environment, i.e., in vitro, cells can be electrically stimulated via different methods. In this project, the student will:

• Perform literature search and study to get familiar with different methods of applying electrical stimulation to cells in vitro; cell-EF interaction; physiological levels of cell electrical stimulation and relevant parameters
• Build a finite element method (FEM) based model of a DC electrotactic chamber as described in [1], and, simulate the resultant electric field within the chamber
• Study the changes in the electric field distribution within the chamber in the presence of single and multiple cells

References: