

A Mathematical Study of Tissue Electroporation to Drug Delivery

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ABSTRACT

Electroporation is a useful technique to increase the number of pores in cell membranes. This is done by applying suitable electric pulse to the cell. In recent times, electroporation is applied to transport drug molecules into the cells of a tissue. A mathematical model of drug delivery with bulk electroporation is proposed in this study. Both reversible and irreversible electroporations are considered. This leads to a set of differential equations, which are solved analytically and numerically, according to the complexity, with appropriate initial and boundary conditions. The time variant drug concentrations in extracellular space as well as in reversible and irreversible electroporated cells are presented and discussed through graphical representations.