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Conferencia

por

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título

"Impact of permeabilization and pH effects in the electrochemical treatment of tumors: Experiments and simulations"

Abstract:

Electrochemical treatment is used in the local control of solid tumors in preclinical and clinical studies. We study pH fronts, permeabilization, electrical field and concentration of four chemical species in a tissue under electrochemical treatment by means of in vitro and in silico modeling. The in vitro model uses a piece of potato (*solanum tuberosum L.*) as analogy of tumor tissue, due to the characteristics of the potato tissue and the way in which it reacts against pH and potential. The in silico model solves the two-dimensional Nernst-Planck equations for ionic transport in a fourion electrolyte. Modeled ions demonstrate the diffusive regime of ionic transport and show the little influence of the low electric field applied on this phenomenon. This work evidences that extreme pH fronts affect the permeabilization of the tissue and consequently its destruction. We also evaluate different shapes of electrode arrays by means of simulated and in vitro models. We concluded that the higher area of necrotic tissue was achieved for the greater separation between electrodes.

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