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Loco-regional breast cancer therapy through *in situ* thermosensitive Tamoxifen citrate niosomal gels

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Loco-regional delivery of Tamoxifen Citrate (TMC) is used in this study to localize its activity into the vicinity of tumor and hence improving therapeutic outcome with less toxicity on other organs. Herein, innovative TMC niosomal thermosensitive gels were proposed as a tool to achieve this goal. Niosomes were prepared by thin lipid film hydration technique and evaluated for cellular uptake and cytotoxicity. The anti-cancer activity was also tested *in-vitro* using MCF-7 breast cancer cell line. Moreover, *in-vivo* anti-tumor efficacy was examined in Ehrlich carcinoma mice model through reporting solid tumor volume regression and tissue TMC distribution. Significantly enhanced cellular uptake (2.8 fold) and greater cytotoxic activity with MCF-7 breast cancer cell line were obtained from vesicles prepared with span 60: cholesterol (1:1 molar ratio). Niosomes were then packed in thermosensitive gels using cold method. TMC niosomal thermosensitive gels were evaluated for gelation temperature, rheological behavior and *in-vitro* drug release. Type and ratio of used poloxamers were manipulated to provide an optimal gelation temperature (34-37°C). Rheological analysis showed low viscosity and elasticity values at low temperature while these values significantly increased at elevated physiological temperature. A prolonged release of TMC following a diffusion-driven release model was detected. Furthermore, *in-vivo* data showed evidently that anticancer activity was improved with significant retention of the drug at the tumor site. These encouraging results confined that this *in situ* gel depot offers an attractive approach for controlled delivery of TMC and clinically expected to be useful candidate in breast cancer loco-regional therapy.

Biography

Dalia Samuel Shaker is a Professor of Pharmaceutics at the College of Pharmacy, Future University, Cairo, Egypt. She has 20 years of academic and industrial experience in Pharmaceutical Sciences; her Doctoral research was performed at the University of Utah, USA with Prof. William I. Higuchi on transdermal drug delivery using radioactive permeants, permeation promoters and chemical enhancers. Her Post-doctorate research was conducted at Oregon State University, Corvallis, Oregon, USA, on transdermal vaccines. Her research has resulted in 27 publications in international journals and 14 presentations at international conferences. She is a Editorial Board Member of of *Future Journal of Pharmaceutical Sciences*.

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