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Evaluation of the cytotoxicity of ruthenium (II) phthalocyanine complex in a melanoma cell line in liposomal delivery system compared to complex free

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There is an expanding use of the photodynamic therapy, an alternative treatment in which a photosensitive substance, such as ruthenium phthalocyanines (pc), is activated by visible light, for tumor treatment. However, in some cases, the free photosensitive does not work very well. Therefore, the use of liposomes as drug delivery systems is the most promising technique for improving the drug delivery especially for anticancer therapy. The objective of this study was to evaluate the cytotoxic potential, according MTT assay, of a monocarboxylated (mc) ruthenium (II) phthalocyanines complex either with or without photo stimulation, free and in the liposome, in a murine melanoma (B16/F10) cell line. The cytotoxicity resulting from the exposure of B16/F10 cell line to the complex [Ru(Cl2)mcpc] was greater when encapsulated in the liposome, with and without photo stimulation, compared to the free photosensitizer. Fluorescence microscopy techniques showed the internalization of the liposome and also the free complex, however higher accumulation of the liposome is visualized in the images. The preliminary results suggest that the liposomes encapsulating with the complex [Ru(Cl2)mcpc] improve the penetrability of the complex inside the cells, and it immediately increases the cytotoxicity and favors the treatment of cancer in photodynamic therapy, in this model. Other assays are being conducted to better understand the mechanism involved and stability of liposome. The drug delivery system in liposomes may be successfully employed as an alternative treatment strategy for cancer therapeutics in the near future.

Biography

Uzuelli J A concluded the Doctorate in the Area of Pharmacology through the Faculty of Medicine of USP, São Paulo University, in 2010, and studied pharmacological and biochemical aspects in pulmonary embolism. Currently, she is a Postdoctorate and she is studying the biochemical mechanisms involved in the cytotoxicity and cell death of cells tumor lines tested with phthalocyanine ruthenium II complex and associated with the photodynamic therapy under the supervision of Prof. Dr. Roberto Santana da Silva, in Pharmaceutical Sciences Faculty, São Paulo University, Ribeirão Preto city, Brazil.

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