AIM

Designing of thermosensitive liposomes for encapsulation of anticancer drugs for use as targeted drug delivery systems in combination with localized hyperthermia and radiation for more effective management of cancer.

OBJECTIVES

To use a novel approach to prepare heat sensitive liposomes from natural lipids viz., egg phosphatidyl choline and cholesterol, showing gel to fluid crystalline phase transition at 43°C (Tm), temperature attainable in clinical hyperthermia.

To determine the antitumor efficacy of thermosensitive liposomes entrapped antitumor drugs in combination with localized hyperthermia in murine tumors.

To study the biodistribution of thermosensitive liposomes entrapped Na\textsuperscript{125}I-BSA and to evaluate the in vivo stability of these liposomes in the presence of serum.

To achieve the above mentioned objectives work was conducted along the following lines:

(i) Preparation of thermosensitive liposomes from egg PC and cholesterol obtained from different sources and determination of phase transition temperature of these liposomes by Differential Scanning Calorimetry(DSC). Use of thermosensitive liposomes for encapsulation of anticancer drugs.
(ii) Determination of biodistribution and blood clearance of thermosensitive liposomes injected in melanoma bearing C57Bl/6 mice and studying the effect of hyperthermic treatment on these parameters.

(iii) Study the uptake of thermosensitive liposomes by tumor tissue and monitor the in vivo release of encapsulated compounds in tumors by hyperthermic treatment.

(iv) Comparison of therapeutic efficacy of hyperthermia, chemotherapy, radiation, alone or in various combinations, in murine melanomas.

(v) Determination of in vivo efficacy of thermosensitive liposomes entrapped drugs in combination with localized hyperthermia and/or radiation in murine tumors.

(vi) Comparison of the antitumor efficacy of drugs encapsulated in thermosensitive natural lipid derived liposomes with antitumor efficacy of drugs entrapped in thermosensitive liposomes prepared from synthetic lipids such as dipalmitoyl phosphatidyl choline and distearoyl phosphatidyl choline for determination of usefulness of natural lipid derived thermosensitive liposomes over synthetic liposomes in cancer therapy.