S6-1.1

PEG-ylated Phenothiazine Derivatives. Synthesis and Antitumor Activity

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Phenothiazine based compounds are well known for their successful application in bio-medicine. Used for many years for the synthesis of many classes of drugs, in the last two decades the phenothiazine derivatives proved a promising potential for the cancer treatment. Taking into account phenothiazine properties and poly(ethylene glycol) biocompatibility, a series of three new PEGylated phenothiazine derivatives were prepared by grafting PEG chains to the phenothiazine core. The structure of the targeted molecules was confirmed by FTIR and NMR spectroscopy. The capacity of the synthetized compounds to self-assembly in water was studied by DLS and UV-vis techniques. Their biocompatibility was assessed on normal human dermal fibroblasts and five human cancer cell lines. The synthetized compounds proved excellent biocompatibility on normal cells. A concentration dependent cytotoxicity against cancer cell lines was noticed for two of synthesis PEGylated phenothiazine derivatives. In vivo anti-tumor investigations presented high tumor inhibition comparable to traditional drugs.