Novel liposomal nanocarriers for long-term tumor imaging

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Abstract:

PEGylated liposomes have smaller volume of distribution and decreased clearance, consequently, due to their more prolonged presence in bloodstream and maintaining their stability during this period, these liposomes can be applied for imaging tumoral sites.

The purpose of this study is to develop an appropriate radiopharmaceutical agent in long-term imaging for improved diagnosis and evaluation of tumors.

In this study, liposomal formulations encapsulating albumin is synthesized by solvent evaporation method along with homogenization, and their characteristics were assessed. Then these liposomes labeled by Philips method and the rate of stability of labeled liposomes in serum and ultimately the rate of biodistribution and gamma scintigraphy in C26-colon carcinoma tumor-bearing mice were studied.

The result of the study of liposomal characteristics displayed that capable of accumulating in tumor sites based of EPR phenomenon. these liposomes also have high stability for maintaining encapsulated albumin in a long time.

In the study of biodistribution of these liposomes in mice, they accumulated more in the kidney, liver, spleen and tumor sites, which even after clearing formulations in the bloodstream, they existed in high levels in these organs up to 96 hours.

In gamma scintigraphy also, organs with high activity accumulation from early hours up to 96 hours, were visible in the form of hot spots.

concluded that PEGylated liposomal formulation encapsulating albumin can be labeled with In-Oxine , and obtained stabilized formulation for long-term imaging , that have more favorable conditions for the evaluation of tumors and it will cause early diagnosis of tumors.

Key words: Nano liposome, 111In-Oxine, imaging, biodistribution, tumor