

Multi-Functional Liposome Nanocomposites for Diagnosis and Drug Delivery via Membrane Emulsification Technique

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Liposomes have been extensively investigated as carriers for a variety of drugs and contrast agents. Liposomes are usually injected intravenously for systemic applications. We prepared polythiophene, magnetite and doxorubicin (DOX) loaded multi-functional liposome nanocomposites (MFLNs) for bio-imaging and cancer chemotherapy. Liposomes were prepared through thin film cast-hydration method, and monodispersity of liposomes was enhanced through shirasu porous glass membrane. The DOX-loaded liposomes were prepared by using the remote loading method. Luminescent polythiophene and magnetite nanoparticles were encapsulated in an aqueous cavity and inside hydrophobic lipid bilayer of the DOX-loaded liposomes. Inner/Outer structures and size of MFLNs were investigated by TEM and DLS analyses. The encapsulation efficiencies of polythiophene and magnetite nanoparticles and DOX within the MFLNs were measured by photoluminescence photometer and UV-vis spectrophotometry.