Optical Properties of Quantum Dots Encapsulated in Liposomes

L.G. Miranda Calderón1, J. Douda1


Semiconductor quantum dots (QDs), has become an ever-present stalwart in the application of nanotechnology to the biomedical sciences, there has been an increasing number of reports of QD application as bright luminescent labels for molecular diagnostics, ultrasensitive in vitro assays and tumor imaging. Comprehensive characterization, has become important to their successful application, one of the most notable characteristics of QDs include unique optical properties [1]. Liposomes constitute one of the clinically most established type of nanoparticle today, with an extensively investigated pharmacological profile for various therapeutic and diagnostic applications due to their ability to carry, into their structure, hydrophilic and hydrophobic molecules [2]. Quantum dots (QDs) have been incorporated into liposomes and mostly used for labeling in biochemical and biomedical aims [3]. They offer a promising solution for QDs encapsulation to prevent citotoxity and are good vehicles for the transport of drugs. Additionally, their surface charge can be easily modified with established methodologies [4]. We assumed that loaded liposomes are able to improve optical properties of QDs due to their signal-amplification properties. For this reason, QDs CdSe have been encapsulated in liposomes prepared by the method of lipid film hydration and sonication with a variety of phospholipid liposomes PC (phosphatidylcholine), DPPC (1,2 dipalmitoyl-sn-glycerol-3-phosphoethanolamine), DSPE (1,2-distereoyl-sn-glycero-3-phosphoethanolamine) and derivates of polyethylene glycol (PEG). Loaded liposomes were characterized by fluorescence and photoluminescence to evaluate the optical properties of the QDs encapsulated.

Keywords: Quantum dots, Liposome, Encapsulation

References:


Presenting author’s email: gabymircal@hotmail.com