J Nanomater Mol Nanotechnol 2018, Volulme: 7
DOI: 10.4172/2324-8777-C10-048

Effects of vesicle compositions on their characteristics

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Niosomes and liposomes are self-assembled vesicles which are suspended in aqueous media and they can encapsulate drugs for better effectiveness, targeting, and delivery. In this research, small unilamellar vesicles and large unilamellar vesicles of both liposomes and niosomes were successfully produced using the thin film hydration method. Gel-chromatography column with Sephadex G-50 and dialysis methods were used to separate the non-encapsulated free drug. For niosomes, Span® 60 or 65 as a non-ionic surfactant with cholesterol and Cremophor® ELP as a co-surfactant were used; effect of incorporation of a model hydrophobic drug (cinnarizine) into the niosomal formulations was studied regarding niosomes' size, polydispersity, and vesicle charge. Dynamic light scattering was employed for vesicle size measurements. For liposomes, DPPC and DSPC lipids were utilized with or without cholesterol and the prepared liposomes converted to lipoplexes by the inclusion of a plasmid DNA and the ability of lipoplexes to transfect cancer cell lines was investigated. Some liposome formulas, with reduced vesicle size via probe sonication or bath sonication, showed good transfection efficiency. In conclusion, liposomes and niosomes are promising delivery vehicles.

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