World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:9, No:02, 2015

Nanoparticles-Protein Hybrid-Based Magnetic Liposome

Authors : Amlan Kumar Das, Avinash Marwal, Vikram Pareek

Abstract : Liposome plays an important role in medical and pharmaceutical science as e.g. nano scale drug carriers. Liposomes are vesicles of varying size consisting of a spherical lipid bilayer and an aqueous inner compartment. Magnet-driven liposome used for the targeted delivery of drugs to organs and tissues1. These liposome preparations contain encapsulated drug components and finely dispersed magnetic particles. Liposomes are vesicles of varying size consisting of a spherical lipid bilayer and an aqueous inner compartment that are generated in vitro. These are useful in terms of biocompatibility, biodegradability, and low toxicity, and can control biodistribution by changing the size, lipid composition, and physical characteristics2. Furthermore, liposomes can entrap both hydrophobic and hydrophilic drugs and are able to continuously release the entrapped substrate, thus being useful drug carriers. Magnetic liposomes (MLs) are phospholipid vesicles that encapsulate magneticor paramagnetic nanoparticles. They are applied as contrast agents for magnetic resonance imaging (MRI)3. The biological synthesis of nanoparticles using plant extracts plays an important role in the field of nanotechnology4. Green-synthesized magnetite nanoparticles-protein hybrid has been produced by treating Iron (III)/Iron(II) chloride with the leaf extract of Dhatura Inoxia. The phytochemicals present in the leaf extracts act as a reducing as well stabilizing agents preventing agglomeration, which include flavonoids, phenolic compounds, cardiac glycosides, proteins and sugars. The magnetite nanoparticles-protein hybrid has been trapped inside the aqueous core of the liposome prepared by reversed phase evaporation (REV) method using oleic and linoleic acid which has been shown to be driven under magnetic field confirming the formation magnetic liposome (ML). Chemical characterization of stealth magnetic liposome has been performed by breaking the liposome and release of magnetic nanoparticles. The presence iron has been confirmed by colour complex formation with KSCN and UV-Vis study using spectrophotometer Cary 60, Agilent. This magnet driven liposome using nanoparticles-protein hybrid can be a smart vesicles for the targeted drug delivery.

Keywords : nanoparticles-protein hybrid, magnetic liposome, medical, pharmaceutical science
Conference Title : ICNST 2015 : International Conference on Nano Science and Technology
Conference Location : Kuala Lumpur, Malaysia
Conference Dates : February 12-13, 2015

Open Science Index, Materials and Metallurgical Engineering Vol:9, No:02, 2015 publications.waset.org/abstracts/15000.pdf