



The Efficiency of TiO₂ Nanoparticles Synthesized from Aloe Vera Leaves Extract Compared to Liposomes as Delivery System for Doxorubicin: In Vivo Study Using Erlich Solid Tumor Model

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Abstract

Doxorubicin (Dox) is well known for its broad spectrum anticancer activity; however it suffers from severe toxicity. The primary goal of loading Dox in different nanodelivery systems is to decrease nonspecific organ toxicity.

Dox encapsulated liposome (Doxil) has been approved by FDA for ovarian cancer and Kaposi's sarcoma treatment in United States. However, the researchers are still going on to optimize the liposomes and to compare them to other types of nanoparticles.

Titanium dioxide nanoparticles (TiO₂NPs) have been the focus of many promising applications due to their unique properties, low cost, availability and biocompatibility. This study illustrates a simple, safe, low cost and ecofriendly technique for green synthesis of TiO₂NPs from Aloe Vera leaves extract at different pH values. Doxorubicin was loaded in liposomes and conjugated to greenly synthesized TiO₂NPs. Both formulas were fully characterized then they have been injected in mice bearing Ehrlich tumor and compared to aqueous solution of Dox. Tumor volume measurements and histopathological examination were conducted. The results revealed that both formula of Dox were more efficient than aqueous Dox solution, however, Dox encapsulated in liposomes showed more efficiency in treatment of tumor.

Nanotechnology in developing and improving the delivery of drugs particularly, photosensitizers and anticancer drugs. I have about 5 published papers in reputed journals covering many types of nanoparticles especially liposomes, polymeric, metallic and gold nanoparticles.

Speaker Publications:

1. "Antitumor Efficiency of Doxorubicin Loaded in Liposomes and Poly Ethylene Glycol Coated Ferrofluid Nanoparticles"; J Nanomater Mol Nanotechnol. / 2015 / 4(1) /pp 1731-1735.

[32nd Nano Congress for Future Advancements](#); Webinar- June 12-13, 2020.

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Biography:

Doaa A Abdelfadeel, a lecturer in Medical Applications of Laser Dep., National institute of laser enhanced sciences, Cairo University. B.Sc. degree in pharmaceutical sciences from the Faculty of pharmacy, Cairo University, M Sc. and Ph.D. degrees in laser applications in pharmaceutical sciences from National institute of laser enhanced sciences, Cairo University. My researches and post-doctoral studies mainly focus on using