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### The anticancer activity of the combination therapy of Gemcitabine and Doxorubicin encapsulated in a nanoemulsion

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**D**oxorubicin (DOX) is a chemotherapeutic drug used for the treatment of a wide variety of cancers. It is known to cause cardiotoxicity. Gemcitabine (GEM) is an anticancer drug, but it has certain limitations like short biological half-life. A new paradigm to improve DOX and GEM therapeutic index is to administer them in nanoparticles (NPs). Nanoemulsions (NEs) are well-characterized NPs drug carriers that have been broadly implemented in the delivery of anticancer therapeutics. In this study, the antitumor activity of the combination formulas of GEM and DOX, either loaded in water (GEM+DOX-Sol) or NEs (GEM+DOX/LNE), were evaluated in Ehrlich ascites carcinoma (EAC) bearing swiss albino mice. The anticancer assessment of the NEs formulas in 200 mice divided into 10 groups included the detection of the change in body weight, hematological and serum biochemical profiles and studying the histopathological alterations of the heart, liver and kidney tissues. Results showed that mice treated with GEM+DOX/LNE, which has z-average 155.38 nm and zeta potential of -38.5 mV, recorded a decrease in the mean tumor weight and significant increase in the cumulative mean survival time (MST), which was 60 days, as compared to the EAC control group, which has MST of 28 days. It also showed no significant changes in hematological and serum biochemical profiles compared to the normal group. In conclusion, the present study suggested that GEM treatment may significantly reduce cardiotoxicity induced by DOX in EAC-bearing mice. Also, GEM enhances the antitumor properties of DOX by increasing its inhibitory effect on tumor growth.

#### Biography

Faiza Abdu is a Professor and the Vice Dean of Faculty of Sciences, Biology Department, King Abdulaziz University, Saudi Arabia. She is also a Supervisor of Neuroscience Unit in King Fahad Medical Research Center. Her experimental approach is on physiology and neuroscience. She has collaboration with many scientists in many fields mainly in cancer and nanotechnology.

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