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A novel anis amide anchored nanocarrier for site specific/targeted delivery of bioactive: A preclinical study

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Gemcitabine (2', 2'-difluorodeoxycytidine) is a deoxycytidine (nucleoside) analog with significant antitumor activity against variety of cancers including non-small cell lung cancer. However, rapid metabolism and shorter half-life of drug mandate higher dose and frequent dosing schedule which subsequently results into higher toxicity. Therefore, there is a need to design a vector which can reduce the burden of frequent dosing and higher toxicity associated with the use of gemcitabine. In this study, we investigated the possibility of improving the targeting potential by employing the surface modification on CTS/PEG NPs. We demonstrate formulation and characterization of chitosan/poly (ethylene glycol)-anisamide (CTS/PEG-AA) and compared its efficiency with CTS/PEG and free gemcitabine. Our results reveal its sizeable compatibility, comparatively less organ toxicity and higher antitumor activity *in vitro* as well as *in vivo*. This wealth of information surfaces the potential of CTS/PEG-AA nanoparticles as a potent carrier for drug delivery. In brief, this novel carrier opens new avenues for drug delivery which better meets the needs of anticancer research.

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Gold nanoparticles enhanced photodynamic therapy to control microbial infections with special reference to dental caries

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Antibiotics provide the main basis for the therapy of microbial (bacterial and fungal) infections. Since the discovery of these antibiotics and their uses as chemotherapeutic agents there was a belief in the medical fraternity that this would lead to the eventual eradication of infectious diseases. But with the emergence of multi drug resistance (MDR) and other virulence factors especially formation of biofilm, the scenario has been changed. These antibiotics are becoming ineffective against bacterial and fungal infections. In this paper, we proposed a novel approach of using gold nanoparticles enhanced photodynamic therapy to control microbial infections with special reference to dental caries. The structural, compositions and morphology characterization of the as synthesized gold nanoparticles were performed using X - ray diffraction (x-ray), Fourier transform infrared spectroscopy (FTIR), field emission scanning electron microscopy (FESEM), energy dispersive spectroscopy (EDS) and high resolution transmission scanning electron microscopy (HRTEM). The average size of gold nanoparticle is found to be 24.03 nm. This work is a new approach in order to control the infection caused by MDR.

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