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Physicochemical and in vitro cytotoxicity evaluation of polymeric drugs for combination cancer therapy

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Abstract

Platinum-based drugs are potent anticancer drugs and are effective for the treatment of various cancers. However, they are limited pharmacologically due to toxic side effects, drug resistance and poor water solubility. In order to overcome these limitations, platinum was incorporated onto polyamidoamine carriers together with alendronate and procaine hydrochloride to form a series of conjugates. Cytotoxicity was assessed using the sulforhodamine B assay on MCF-7, MDA-MB-231 and EA.hy926 cell lines. The polymer-drug conjugates showed cytotoxicity which was selective to the cancer cell lines. The free drugs decreased cell density in all cell lines and were nonspecific. These findings indicate that the incorporation of bioactive agents onto polymers can overcome cytotoxicity associated with the drugs. The selective inhibitory effects of the conjugates towards the cancer cell lines suggest that these conjugates are potential therapeutics for combination therapy.