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Polyamidoamine-Drug Conjugates Containing Metal-Based Anticancer Compounds

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ABSTRACT:

Polyamidoamine drug conjugates containing ferrocene and platinum analogues were prepared in this study. Fourier transform infrared spectra confirmed the successful isolation of the conjugates with signals at 3300 cm−1 for amide N–H stretch and for C=O stretch at 1655–1635 cm−1 resulting from the conjugation of 4-ferrocenylketobutanoic acid. The polyamidoamine drug conjugate particle size was 247.1 nm and 258.3 nm suggesting their ability to exhibit in vitro phagocytosis. The average particle charges were 29 and 30.2, which was indicative of good stability and the capability to resist aggregation. In vitro cytotoxicity studies further revealed that the conjugates 1–5 did not exhibit cytotoxicity towards the normal cell lines (EA. hy926) whereas high cytotoxic activity was noted against the cancer cell lines (MCF-7 and MDA-MB-231) indicating selectivity towards cancer cell lines. Fc-PDA acted as a potentiating agent when incorporated together with DACH PtCl2 in the polymers, resulting in a good inhibitory effect in vitro. However, when combining Fc-PDA with K2PtCl4 in the polymer, an antagonistic effect was noted. The current findings implicate that the prepared conjugates hold the potential as therapeutics for the treatment of breast cancer. Further research is required to confirm this.