

pH-sensitive amphiphilic polyaspartamide derivatives for paclitaxel delivery

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Polymers that respond to a small change in pH have a wide range of applications. In particular, much attention has been paid to pH-sensitive drug delivery systems such as tumor targeting anticancer drug delivery, because it was reported that the extracellular pH of tumors is approximately 6.5~7.0, which is lower than that of normal tissues (pH 7.4). Amphiphilic polyaspartamide derivatives were synthesized by a successive graft reaction of octadecylamine, O-(2-aminoethyl)-O'-methylpolyethylene glycol, and 1-(3-aminopropyl)imidazole on polysuccinimide, and then a paclitaxel, one of best anti-neoplastic drugs, was loaded into graft copolymers using simple method of controlling pH of polymer solution. Paclitaxel release profile was investigated at various pHs by HPLC method. These polyaspartamide derivatives had an excellent property which could respond to very small pH change around pH 7. They also showed high paclitaxel loading efficiency and triggered drug release behavior at acidic pH. These pH-sensitive polymers are a potential candidate for tumor targeting drug delivery carrier which require a triggered release system.