

论文

载药磁性阳离子高聚物脂质体的制备及表征

梁晓飞, 王汉杰, 田惠, 罗浩, 成靖, 郝丽娟, 常津

天津大学材料科学与工程学院纳米生物技术研究所, 天津 300072

摘要:

通过羧甲基壳聚糖接枝二甲基十八烷基环氧丙基氯化铵, 合成了水油两溶性的羧甲基壳聚糖十八烷基季铵盐(QACMC), 并用其代替合成磷脂与胆固醇反应, 制备阳离子高聚物脂质体(CPL). 利用阳离子高聚物脂质体包覆水溶性Fe₃O₄磁流体, 构建磁性阳离子高聚物(MCPL)体系. 用TEM, DLS, VSM, FTIR及Zeta电位仪等对所制样品进行表征. 结果表明, 磁性阳离子高聚物脂质体在水相中可稳定存在, 粒径可达到15.3 nm, 分散性较好, Zeta电位可达到+38.22 mV, 比饱和磁化强度为27.9 A·m²/kg, 具有超顺磁性; MCPL对药物长春新碱的封装率可达到93.1%, 在Tris-HCl(pH=7.4)缓冲溶液中具有较好的缓控释功能.

关键词: 壳聚糖季铵盐 Fe₃O₄ 磁流体 高聚物脂质体 磁性脂质体

Preparation and Characterization of Novel Magnetic Cationic Polymeric Liposomes

LIANG Xiao-Fei, WANG Han-Jie, TIAN Hui, LUO Hao, CHENG Jing, HAO Li-Juan, CHANG Jin*

Institute of Nanobiotechnology, School of Materials Science and Engineering, Tianjin University, Tianjin 300072, China

Abstract:

Octadecyl quaternized carboxymethyl chitosan(QACMC) was synthesized through carboxymethyl chitosan grafting with glycidyl octadecyl dimethylammonium chloride. Then, novel magnetic cationic polymeric liposomes(MCPL) formed from QACMC/cholesterol and Fe₃O₄ ferrofluid were prepared via Thin-Layer Evaporation. The structure and properties of all samples were characterized via TEM, DLS, VSM and FTIR. The results show that the superparamagnetic cationic polymeric liposomes were prepared successfully. It was stable in aqueous phase and had a high zeta potential of +38.22 mV. The average diameter of MCPL was about 15 nm and the saturation magnetization value of it was 28 A·m²/kg at 300 K. Vincristine as a kind of hydrophilic components was entrapped into its aqueous core. Vincristine encapsulation efficiency of MCPL was 93.1% and it exhibited a slow steady release of vincristine over two weeks at 37 °C in Tris-HCl(pH=7.4).

扩展功能

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Keywords: Quaternized chitosan Fe₃O₄ ferrofluid Polymeric liposomes Magnetic liposomes

收稿日期 2007-09-17 修回日期 1900-01-01 网络版发布日期

DOI:

基金项目:

通讯作者: 常津

作者简介:

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