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叶酸受体介导的壳聚糖-pGPU6/GFP/Neo纳米粒靶向转染肿瘤细胞的特点 点此下载全文

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摘要：

目的：研究叶酸受体介导下的壳聚糖-pGPU6/GFP/Neo纳米粒在叶酸受体表达程度不同的肿瘤细胞中的靶向转染特点。方法：制备叶酸偶联壳聚糖pGPU6/GFP/Neo纳米粒（folate-chitosan-pGPU6/GFP/Neo,FA-CS-DNAnano）和壳聚糖pGPU6/GFP/Neo纳米粒（chitosan-pGPU6/GFP/Neo,CS-DNAnano），红外光谱扫描鉴定其合成，透射电镜观测纳米粒的形态特征及直径大小。纳米粒转染叶酸受体表达阳性的人类卵巢癌细胞系 SKOV3、乳腺癌细胞系MCF-7和宫颈癌细胞系HeLa，流式细胞术检测细胞转染效率，MTT法检测纳米粒的细胞毒性。结果：成功制备FA-CS-DNAnano和CS-DNAnano，纳米粒接近球型、表面光滑、结构均匀；FA-CS-DNAnano直径为（78.1±0.3）nm，CS-DNAnano直径为（138 4±0.7）nm。FA-CS-DNAnano在 SKOV3和 MCF-7细胞的转染效率明显高于CS-DNAnano \[（24.3±0.7）% vs（0.7±0.1）%，（16.8±1.2）% vs（0.3±0 1）%；均P<0 01\]，而在HeLa细胞中两者转染效率无明显差异 (P>0.05)。FA-CS-DNAnano转染前后MCF-7、SKOV3 和 HeLa细胞的活力分别为（87.9±2.4）%、（91.4±1.0）%、（97.4±1.1）%和（63.0±2.5）%、（90.6±13）%、（99.3±1.6）%。结论：对于叶酸受体强阳性表达的SKOV3和MCF-7肿瘤细胞，叶酸偶联壳聚糖是良好的靶向基因转运载体。

关键词：叶酸 壳聚糖 基因靶向转运载体 卵巢肿瘤 乳腺肿瘤 宫颈肿瘤

Folic acid receptor-mediated targeted transfection of chitosan-pGPU6/GFP/Neo nanoparticles into tumor cells Download Fulltext

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Abstract:

Objective:To investigate folic acid receptor-mediated targeted gene delivery of chitosan-pGPU6/GFP/Neo nanoparticles to tumor cells expressing different degrees of folic acid receptors. Methods: Folate-chitosan-pGPU6/GFP/Neo nanoparticles (FA-CS-DNAnano) and chitosan-pGPU6/GFP/Neo nanoparticles (CS-DNAnano) were prepared and identified by infrared spectrometer, and their morphology characteristics and diameters were observed under transmission electron microscope. Human ovarian cancer cell line SKOV3, breast cancer cell line MCF-7, and cervical cancer line HeLa were transfected with the prepared nanoparticles; the transfection efficiency was evaluated by flow cytometry; and cytotoxicities of the nanoparticles were detected by MTT method. Results: FA-CS-DNAnano and CS-DNAnano were successfully prepared. The particles had a smooth surface and a uniform structure, with the diameters being (78.1±0.3) nm and (138 4±0.7) nm. Transfection efficiency of FA-CS-DNAnano was significantly higher than that of CS-DNAnano in SKOV3 and MCF-7 cells (\[24.3±0.7\]% vs \[0.7±0.1\]%, \[16.8±1.2\]% vs \[0.3±0.1\]%; all P<0.01), but not in HeLa cells (P>0.05). The cell vitalities of MCF-7, SKOV3 and HeLa cells were (87.9±2.4)%, (91.4±1 0)%, (97.4± 1.1)% before transfection, and were (63.0±2.5)%, (90.6±1.3)%, and (99.3±1.6)% after transfection with FA-CS-DNAnano. Conclusion: Chitosan modified with folic acid is an efficient target gene carrier for folic acid receptor highly positive SKOV3 and MCF-7 tumor cells.

Keywords:folic acid chitosan targeted gene delivery orarian neoplasmas breast neoplasmas cervical neoplasmas

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