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叶酸受体靶向液态氟碳纳米粒造影剂的制备及体外寻靶

Preparation of folate receptor-targeted contrast agent with liquid fluorocarbon nanoparticles encapsuled in lipid membrane and its targeting performance study in vitro

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英文关键词: [Folate receptor](#) [Target](#) [Liquid fluorocarbon](#) [Contrast media](#)

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中文摘要:

目的 制备叶酸受体靶向的被脂质包裹的液态氟碳纳米粒造影剂,鉴定其基本性质,观察其体外靶向性能。方法 以氯仿将偶联叶酸的磷脂[DSPE-PEG(2000)]按照一定比例溶解在成膜中,用旋转蒸发仪去除有机溶剂成膜,加入磷酸盐缓冲液重新水合后,在悬液中逐滴加入适量液态氟碳,均质乳化后得到叶酸受体靶向的纳米粒造影剂。在人卵巢癌SKOV3细胞中验证该造影剂的靶向性能(靶向造影剂组),并与不带叶酸的普通造影剂组和游离叶酸干预组相比较。结果 叶酸受体靶向液态氟碳纳米粒造影剂外观与普通造影剂无明显差别。体外靶向实验发现此造影剂聚集且牢固地黏附于SKOV3细胞,而普通造影剂组和游离叶酸干预组则未见明显特异性结合。结论 成功制备了偶联叶酸的被脂质包裹的液态氟碳纳米粒造影剂,该造影剂对高表达叶酸受体的SKOV3细胞具有较强的亲和力,有望成为卵巢癌靶向显影与治疗的理想分子探针。

英文摘要:

Objective To prepare folate receptor-targeted contrast agent with liquid fluorocarbon nanoparticles agent encapsuled in lipid membrane, to identify its basic characteristics, and to investigate its targeting performance in vitro. **Methods** DSPE-PEG (2000) Folate was dissolved in the materials of lipid membrane with chloroform according to the certain proportion. The solution was moved in the rotary evaporator to remove the organic solvent and obtain lipid film. The film was rehydrated with phosphate buffer solution, then liquid fluorocarbon was added into the suspension. After emulsification and homogenization, the folate receptor-targeted nanoparticles contrast agent was prepared. The targeting performance of the agent was checked in human SKOV3 cells line in vitro (targeted contrast agent group) and compared with non-folic acid conjugated general agent group and the free folic acid intervention group. **Results** The appearance of folate receptor-targeted contrast agent was similar to that of liquid fluorocarbon nanoparticles and general contrast agent. The targeting experiment in vitro showed that a large amount of folate receptor-targeted nanoparticles were aggregated and adhered firmly to SKOV3 cells. No significant specific binding was seen in the non-folic acid conjugated general agent group and the free folic acid intervention group. **Conclusion** The folic acid conjugated contrast agent with liquid fluorocarbon nanoparticles encapsuled in lipid membrane can be prepared successfully. The contrast agent having strongly specific affinity on the SKOV3 cells with the high level expression of folate receptor is expected to provide an ideal molecular probe for the target imaging and treatment of ovarian cancer.

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