山东大学学报(医学版) 2012, 50(3) 29- DOI: ISSN: 1671-7554 CN: 37-1390/R

论文

Glu-GNPs对人肺腺癌细胞株A549放射增敏的初步探讨

李晓红1，胡立宽1,2，王翠红1，杜元娜1

山东大学 1.齐鲁医院肿瘤中心放疗科， 济南 250012； 2.医学院， 济南 250012

摘要：

目的 探讨偶联葡萄糖的纳米金颗粒(Glu GNPs)对人A549细胞的放射增敏作用及其机制。方法 噻唑蓝(MTT)法检测低浓度(≤20nmol/L)Glu-GNPs联合放射对A549细胞存活的影响，克隆形成检测Glu-GNPs对A549细胞的放射增敏作用，流式细胞仪(FCM)检测细胞周期及其凋亡。结果 低浓度Glu GNPs对A549细胞生长无明显抑制，联合X射线后具有抑制作用，在15nmol/L范围内，随浓度增大，抑制作用增强；15nmol/L Glu-GNPs对A549细胞有放射增敏作用，由Dq、Do计算放射增敏比(SER)分别为1.93、1.10；Glu-GNPs、单纯放射均可诱导细胞凋亡，凋亡率分别为(7.64±1.43)%、(13.46±1.99)%,联合放射组凋亡率为(21.43±1.04)%，显著高于前两组(P<0.01)；Glu-GNPs作用后，细胞周期发生变化，表现为S期减少, G2／M期增加(P<0.05)。结论 Glu-GNPs对人肺腺癌细胞株A549具有放射增敏作用，其机制可能为抑制细胞亚致死损伤修复 ,阻滞细胞于G2/M期, 并诱导细胞凋亡。

关键词： 纳米金；A549细胞；放射敏感性；细胞凋亡

Radiosensitivity enhancement of the human lung adenocarcinoma cell line A549 by Glu-GNPs

LI Xiao-hong1， HU Li-kuan1,2， WANG Cui-hong1， DU Yuan-na1

1. Department of radiotherapy, Center for Cancer, Qilu Hospital of Shandong University, Jinan 250012, China；
2. School of Medicine, Shandong University, Jinan 250012, China

Abstract:

Objective To investigate radiosensitivity enhancement and its mechanism of thio-glucose bound gold nanoparticles (Glu-GNPs) on the lung adenocarcinoma cell line A549. Methods MTT assay was used to determine the effect of Glu-GNPs in low concentrations(≤20nmol/L) combined with radiotherapy on the survival of A549 cells. The radiosensitivity enhancement effect of Glu-GNPs on A549 cells was measured by clonal formation. The cell cycle and apoptosis were assayed by the flow cytometric method(FCM). Results Survival of A549 cells was not obviously restrained by Glu-GNPs in low concentrations. But it was inhibited by Glu GNPs combined with X-ray, and the inhibition was enhanced with the increase of concentrations within 15nmol/L. According to Dq and Do, sensitization enhancement ratios(SER) of A549 cells were 1.93 and 1.10, respectively. Radiation and Glu-GNPs could both induce apoptosis, and their apoptosis rates were (13.46±1.99)% and (7.64±1.43)%，respectively, which were enhanced to (21.43±1.04)% by combined treatment(P<0.01). Glu-GNPs decreased A549 cells at the phase S and increased those at G2/M(P<0.05). Conclusion Glu GNPs could induce radiosensitivity enhancement on the lung adenocarcinoma cell line A549, and the mechanism may be related to restraining repair of sub lethal damage, blocking cells at G2/M and inducing apoptosis.

Keywords: Gold nanoparticles； A549 cells； Radiosensitivity； Apoptosis

收稿日期 2011-10-26 **修回日期** **网络版发布日期**

DOI:

基金项目:

山东省自然科学基金资助课题(Z2005C02)

通讯作者: 胡立宽(1965-)，博士研究生导师，主要从事肿瘤精确放疗及放射增敏的研究。 E-mail：HLK8868@yahoo.com.cn

作者简介: 李晓红(1985-),女，硕士，主要从事肿瘤放射治疗及放射增敏药物的研究。

作者Email:

参考文献：

本刊中的类似文章