عنوان مقاله:

Synergistic cellular toxicity and uptake effects of iodixanol conjugated to anionic linear globular dendrimer G2

محل انتشار:

مجله علوم نانو, دوره 7, شماره 2 (سال: 1399)

تعداد صفحات اصل مقاله: 7

نویسندگان:

Mitra Kiani - *Department of Radiopharmacy, School of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran*

Paria Mojarrad - *School of Pharmacy, Tehran University of Medical Sciences, International Branch, Tehran, Iran*

Mehdi Shafiee Ardestani - *Department of Radiopharmacy, School of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran*

خلاصه مقاله:

Objective(s): Early diagnosis of cancer using noninvasive imaging techniques has been discussed in several recent studies. The present study aimed to assess the synergistic effects of iodixanol-conjugated polyethylene glycol (PEG)-citrate (anionic linear globular) dendrimer G2 on MCF-7 breast cancer cells and human embryonic kidney 293 (HEK293) cells. Materials and Methods: PEG-citrate dendrimer G2 was synthesized and purified. The product was characterized using atomic force microscopy (AFM), electron energy loss spectroscopy (EELS), dynamic light scattering (DLS). At the next stage, the product was conjugated to iodixanol, purified and lyophilized. The cytotoxic effects of the iodixanol, plain PEG-citrate dendrimer G2, and iodixanol-PEG-citrate dendrimer G2 complex were evaluated using methylthiazole-tetrazolium (MTT) assay on the MCF-7 and HEK293 cells. Inductively coupled plasma mass spectrometry (ICP MS) is a mass spectrometry technique, which applies inductively coupled plasma to ionize samples.Results: According to the obtained results, the uptake of PEG-citrate dendrimer G2 iodixanol increased significantly compared to iodixanol alone ($P<0.05$), indicating the importance of lack of significant in-vitro toxicity. Moreover, in the particle size and higher negative zeta potential confirmed the loading of iodixanol in dendrimer G2. Increase, the loading of iodixanol in dendrimer was confirmed by the chemical shifts in HNMR. Conclusion: Therefore, it was concluded that the addition of anionic linear globular dendrimer G2 to iodixanol affected the cellular uptake of the drug with no significant toxicity. Recent findings also confirmed that this novel complex could be applied as an effective cancer imaging agent for molecular biology and molecular imaging applications.

کلمات کلیدی:

Cellular Toxicity, Iodixanol, Linear Globular Dendrimer