with a variety of mammalian cell lines, most of these studies focused on the cytotoxicity of ZnO nanoparticles as a means of assessing biocompatibility (5). ZnO utilizes a multifunctional nanoplatform that bombards malignant cells from the outside. On the other hand, ZnO nanoparticles propose new opportunities including the improvement of the specific drug delivery and also manipulating cell membranes. No cytotoxic effects of ZnO nanoparticles were found in human glioma cells. ZnO nanoparticles are known to be one of the multifunctional inorganic nanoparticles with effective antibacterial activity (6).

Methods: In this study, ZnO/GFP was synthesized previously, used in cell imaging studies for targeting and labeling platform. In the synthesis procedure, initially ZnO/GFP was conjugated through crosslinker. The bonding of GFP to the ZnO nanoparticles yield was detected by High Performance Liquid Radio Chromatography. The complex was labeled with ^{131}I via iodogen method. The yield of radiolabeling of ZnO/GFP was determined by Thin Layer Radio Chromatography. ^{131}I labeled ZnO/GFP (^{131}I/ZnO/GFP) was added to the glioma cells in order to investigate its optical signals. Cytotoxicity studies were carried out on Human glioblastoma cells (U87-MG), 24 hour by MTT method.

Results: The sizes of ZnO were change by the incubation time. Radiolabeling yield of ^{131}I/ZnO/GFP was 98.42±0.90%. There are no toxicity till to concentration 1000 ng/ml limit. U87-MG were used to determinate the time dependent incorporation of ^{131}I, ^{131}I/ZnO and ^{131}I/ZnO/GFP. Due to investigation time dependent incorporation of ^{131}I 0.037 MBq (1.0 µCi/mL) labeled components, the cells were incubated for 1, 2, 4 and 24 hour at 37 °C. Two hour was found as the maximum uptake time.

Conclusion: All experimental results suggest that ^{131}I labeled GFP/ZnO compound can be used in the applications of Nuclear Medicine as a radiolabeled agent for imaging both optical and radioisotopical.

Key words: Green Fluorescent Proteins (GFP), zinc oxide nanoparticles, ^{131}I, glioma cells (U87-MG)
Preferred Presentation Type: Poster Presentation

DOI: 10.4274/mirt.24.01.11

The Effects of (^{99}mTc) Hm-Pao Labeling on Lymphocyte Functions

Özden Ülker[1], Sermin Genç[2], Halil Ateş[2], Neşe Atabey[2], Hatice Durak[1]

[1]*Dokuz Eylül Universty Faculty of Medicine, Department of Nuclear Medicine, İzmir, Turkey*
[2]*Dokuz Eylül Universty Faculty of Medicine, Department of Medical Biology and Genetics, İzmir, Turkey*

Abstract

Objective: (^{99}mTc) HM-PAO labeled leucocytes have been used as a standard diagnostic procedure for the detection of infection and inflammation. Although, some investigators have already pointed out that labeling of leucocytes with (^{99}mTc) HM-PAO has detrimental effects on the cells, still very little is known regarding the effects of ionizing radiation on lymphocyte functions.

Methods: In this study, we evaluated the effects of (^{99}mTc) HM-PAO labeling on lymphocyte adhesion, proliferation, migration and apoptosis. We used NC-NC lymphoblastoid cell line as the lymphocyte population. (^{99}mTc) HM-PAO labeling decreased cell adhesion, proliferation and motility whereas induced apoptosis, and cell cycle arrest. Proliferation assays were performed both using MTT and ELISA tests with 24 hours intervals following labeling.

Results: It was recorded that the rate of decrease in proliferation was up to 70% by the 4th day after labeling. (^{99}mTc) HM-PAO labeling led a 35% decrease on adhesion ability of the cells on fibronectin. By using Boyden chamber motility assay, we showed that both spontaneous and MCP-1 induced lymphocyte motility were potently blocked by (^{99}mTc) HM-PAO labeling. The rate of decrease in motility was approximately five times. In addition, we observed a 12 times increase in the apoptosis rate within the (^{99}mTc) HM-PAO treated cells compared to the control cells. Besides it was observed that cell cycle arrest was induced starting from 3rd day after (^{99}mTc) HM-PAO treatment.

Conclusion: Based on our data (^{99}mTc) HM-PAO labeling has damaging effects on lymphocyte functions including cell adhesion, proliferation, motility and viability in in vitro.

Key words: ^{99}mTc HM-PAO, apoptosis, migration, adhesion
Preferred Presentation Type: Poster Presentation