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Interferon- γ liposome: a new system to improve drug delivery in the treatment of lung cancer

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Abstract

Background: Lung cancer is one of the main causes of death worldwide. Published data show the use of interferons (IFNs) in treating lung tumours. IFNs also have potential for their antiproliferative, antiangiogenic, immunoregulatory and proapoptotic effects. Interferon gamma (IFN- γ) functions as an anticancer agent against various forms of cancer.

Objective: This study aimed to investigate the effect of IFN- γ liposome (nano) on peripheral lymphocytes from 20 individuals in each group: lung cancer patients compared to healthy individuals. The effectiveness of IFN- γ liposome against oxidative stress was also evaluated in this study.

Method: A concentration of 100 U·mL⁻¹ of IFN- γ liposome was used to treat the lymphocytes in the Comet and micronucleus assays based on the preliminary test for the optimal dose.

Results: The lymphocytes from lung cancer patients presented with higher DNA damage levels than those of healthy individuals. In healthy individuals, IFN- γ liposome did not cause any DNA damage in the lymphocytes. Also, it caused a significant reduction in DNA damage in the lymphocytes from lung cancer patients in both the Comet and micronucleus assays. The 100 U·mL⁻¹ of IFN- γ liposome significantly reduced the oxidative stress caused by H₂O₂ and appeared to be effective in both groups using the Comet and micronucleus assays. Results from both Comet and micronucleus assays were consistent.

Conclusion: The data obtained indicated that IFN- γ in both forms (IFN- γ bulk and IFN- γ nanoliposome) may potentially be effective for the treatment of lung cancer and showed the ability of IFN- γ liposome to reduce DNA damage more than the bulk form.

Keywords: Lung cancer, Comet assay, Micronucleus assay, Interferon gamma

Biography

I have over 15 years of experience in different positions and places as a lab specialist professional working with several hospitals systems, lab demonstrator at the University of Bradford, lecturer at Mutah University and now as an assistant professor at Mutah University; I am teaching my students the processes to be the professional lab technician.