عنوان مقاله:

An Investigation of the Effects of Raw Garlic on Radiation-induced Bystander Effects in MCF7 Cells

محل انتشار:

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خلاصه مقاله:

Introduction Radiation-induced bystander effect (RIBE) is a phenomenon in which radiation signals are transmitted from irradiated cells to non-irradiated ones, inducing radiation effects in these cells. RIBE plays an effective role in radiation response at environmentally relevant low doses and in radiotherapy, given its impact on adjacent normal tissues or those far from the irradiated tumor. Reactive oxygen species contribute to RIBE induction. Therefore, the present study was conducted to investigate the possible inhibitory effects of garlic, as an antioxidant-containing plant, on RIBE. Materials and Methods MCF7 cells, treated with raw garlic extracts, were irradiated by 60Co gamma rays, and their culture medium was transferred to non-irradiated autologous bystander cells. Percentage cell viability and micronucleus formation in both irradiated and bystander cells were examined and compared with corresponding cell groups, not treated with garlic. Results Treatment with garlic extract reduced the number of micronucleus-containing cells in both irradiated and bystander cells. However, it only increased the percentage cell viability in bystander cells, not the irradiated ones. Conclusion RIBE was effectively suppressed by raw garlic extracts. Inhibitory effects of raw garlic may be of particular importance for exposure to environmentally relevant low doses, where RIBE dominates direct radiation effects. They are also partially important for addressing the limited therapeutic gain of radiotherapy, as they may only increase the percentage cell viability of bystander cells, not the directly irradiated tumor cells. However, .more comprehensive in-vivo research regarding garlic treatment duration is required to support the obtained results

کلمات کلیدی:

Allium sativum, Antioxidant, MCF7 Cells, Radiation-Induced Bystander Effect, Raw Garlic