

Yanitsa Chantapoon 2013: Effect of Some Flavonoids on Cell Viability and Radiosensitivity of Human Small-Cell Lung Cancer Cell Lines. Master of Science (Applied Radiation and Isotopes), Major Field: Applied Radiation and Isotopes, Department of Applied Radiation and Isotopes. Thesis Advisor: Mr.Somchit Palakas, Ph.D. 87 pages.

In this study, effect of some flavonoids on cell viability and radiosensitivity of lung cancer cell lines comprising of GLC₄ and GLC₄/adr using simplified resazurin assay was investigated. Regarding optimization of resazurin assay, the respective initial cell density of each cell line was 2,000 and 5,000 cells/ml. The optimum incubation time in the presence of resazurin was 4 hours. The obtained condition was applied for cytotoxic test after exposure to doxorubicin. The 50% inhibitory concentrations (IC₅₀) of doxorubicin for GLC₄ and GLC₄/adr cells were 0.012 ± 0.001 μM and 3.751 ± 0.889 μM, respectively and leading to the resistant factor of 320.

Afterwards, the effects of gamma radiation and some flavonoids comprising of apigenin, genistein, naringenin and quercetin were investigated. The radiation dose that inhibited 50% of cell proliferation (LD₅₀) for GLC₄ and GLC₄/adr cells were different with non statistical significance (2.332 ± 0.359 Gy and 3.185 ± 0.856 Gy, respectively). The IC_{50s} of flavonoids mentioned previously were 12.865 ± 1.477 μM, 38.1011 ± 4.4239 μM, 90.0046 ± 5.9171 μM and 20.7960 ± 5.6365 μM, respectively. The respective IC_{50s} of 31.6394 ± 9.6094 μM, 37.3603 ± 6.8091 μM, 76.1026 ± 3.9933 μM and 22.8324 ± 3.578 μM were found for GLC₄/adr cells.

Furthermore, the effect of non toxic concentration of apigenin incorporated with gamma radiation was investigated. The experiments were divided into 4 conditions comprising of exposure to radiation alone, 24 and 72 hrs pre-exposure with apigenin before exposure to radiation and 24 hrs post treatment after exposure to radiation. Pre-treatment and post treatment of GLC₄ cells with apigenin did not modulate significantly radiosensitivity of cells. Meanwhile, pre-treated of GLC₄/adr cells with apigenin for 24 hrs could increase the radiosensitivity with highly statistical significance.

Student's signature

Thesis Advisor's signature