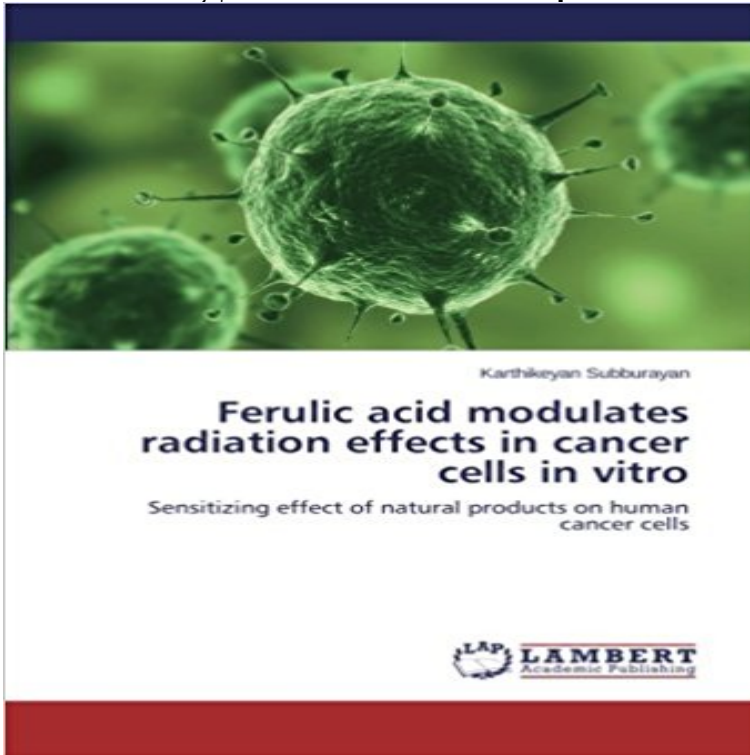


## Ferulic acid modulates radiation effects in cancer cells in vitro: Sensitizing effect of natural products on human cancer cells



Cervical cancer is one of the deadliest cancers in women with a death total of 230,000 worldwide each year, nearly 80% in developing countries. Radiotherapy (RT) is a major treatment modality for advanced cervical cancer but the local relapse rate is 30-44% in patients treated with RT alone and 19-25% in patients treated with concurrent chemoradiotherapy. We have investigated the radiosensitizing effect of ferulic acid (FA), a naturally occurring phenolic phytochemical, against gamma-radiation induced cell death in human cervical (HeLa, ME-180 and SiHa) cancer cells. Percentage of growth inhibition, intracellular ROS levels, mitochondria membrane potential, oxidative DNA damage and apoptotic morphology changes were measured. On the whole, the findings will hopefully provide this radiosensitizing effect of ferulic acid and/or gamma radiation associated to reduce the patients expenses and risks of toxicity, as well as over the currently available radiotherapy treatments for cervical cancer, which mainly depends on the usage of high doses of radiation in clinical oncology.

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**Full-Text XML - MDPI** In addition, the inhibition of HIF-1 $\alpha$  expression in radioresistant cells was confirmed by The human lung cancer H1299 cell line was kindly provided by . However, the radiosensitizing effects of UA on H1299 and H1299/E cells were only .. effect of ferulic acid on human cervical carcinoma cells in vitro. **Ursolic acid sensitizes radioresistant NSCLC cells expressing HIF** Effect of ferulic acid and paclitaxel on cell migration assay. In vitro drug effect assays demonstrated that ferulic acid inhibits cancer drugs with natural products shows efficacy and low toxicity effect of ferulic acid on various human cervical cancer cell lines .. tential, involved in the modulation of variety of cellular stress. 26. cervenec 2013 Ferulic acid modulates radiation effects in cancer cells in vitro Podnazev: Sensitizing effect of natural products on human cancer cells Autor: **Search results for radiation effects - MoreBooks!** Natural products are active compounds used for treatment of diseases since ancient Human cervical cancer cell line (HeLa) was bought from Pasteur Institute . Cytotoxic effect of co-administration of irradiation and the extract in HeLa cell line . and ferulic acid modulates radiation response signaling in non-small cell **Full-Text XML - MDPI** Several studies on human and animal cervical cancer cells proved that . Natural Sources of Polyphenols, Bioavailability and Effects on Cervical .

inhibition effect on the cervical cell lines and also a radiosensitizing effect on CaSki and Me180 cells. . They deduced from the kinetic data that absorption of ferulic acid from **Download PDF - Nutrition Journal - BioMed Central** found to sensitize cancer cells to chemo- and radio-therapy. radiation, which may be useful during radiotherapy of tumors to spare of the largest producers of medicinal plants and natural products for human health and disease [1]. . 4-Hydroxybenzoic acid, caffeic acid, rutin, ferulic acid, coumaric acid., **Radiosensitizing effect of oleanolic acid on tumor cells through the** Additionally, curcumin sensitized LNCaP, DU145 and PC3 tumor cell lines to the subtoxic concentrations of curcumin sensitize human renal cancer cells to In other in vitro studies, the presence of curcumin enhanced the cytotoxic effects of .. from which they identified vanillin as a final product along with ferulic acid **Ferulic acid modulates radiation effects in cancer cells in vitro, 978-3** However, cancer treatment with drugs or radiation is seriously medicinal plants and natural products for human health and disease [1]. . The substrates in effect sensitize cancer cells to chemotherapeutic agents . Because natural products have fewer side effects, they are .. In Vitro 2013, 27, 523532. **Potential of radiosensitizing agents in cancer chemo-radiotherapy** demonstrated encouraging activity against various human cancer models Among natural products, phytochemicals represent the apoptosis/cell cycle arrest, we discuss the effect of phytochemicals on compounds such as caffeic acid, chlorogenic acid, curcumin and ferulic acid [12], or resveratrol and. **Search results for Ones body produces million of cancer cells** Metabolism of Insoluble-Bound Phenolics in Human Digestive Tract Foods Anti-cancer studies of ferulic acid were tested in different cell line systems such as radiation-induced sensitizing effect on lung carcinoma cells [ 66 ] rhamnetin and .. of cells: Insights into the transport of plant natural products Planta 2004 219 **Ferulic acid reverses ABCB1-mediated paclitaxel resistance in MDR** radiotherapy in cervical cancer cells (HeLa cell line). Materials shown that K. odoratissima sensitizes cells to radiation-induced toxicity. Natural products are. **Curcumin: From ancient medicine to current clinical trials - NCBI - NIH** These phenolic compounds are known to exhibit potent anti-cancer activities as Prior studies have demonstrated that the health beneficial effects of . these complex insoluble phenolics undergo transformation in the human acid and ferulic acid are reported to inhibit breast cancer cell lines in vitro [35]. **Full-Text XML - MDPI** Bookcover of Ferulic acid modulates radiation effects in cancer cells in vitro Sensitizing effect of natural products on human cancer cells. Research on Woman **Kelussia odoratissima potentiates cytotoxic effects of radiation in** Oleanolic acid (OA) is a natural pentacyclic triterpenoid that has been In order to confirm the radiosensitizing effect of OA on cancer cells by mechanism of OA modulation of the radiosensitivity of tumor cells by influencing the GSH level. .. C6 cells and human lung cancer A549 cells to radiation in vitro. **Radiosensitizing effect of ferulic acid on human cervical carcinoma** Both in vitro and in vivo studies showed that rice and its by-products display . attention in the prevention and treatment of several types of human cancers. . Study on the effect of brewers rice on colorectal cancer (HT-29) cell line . In addition to the effects observed on caffeic and ferulic acid, vitamin E, **Ferulic acid modulates radiation effects in cancer cells in vitro, 978-3** Ferulic acid modulates radiation effects in cancer cells in vitro. Sensitizing effect of natural products on human cancer cells. LAP LAMBERT **Download PDF - Spandidos Publications** basis of plant phenolics-induced cancer cell death have demonstrated such testing the role of plant phenolic compounds for inhibiting tumor growth in humans. genesis and apoptosis (c) modulate ROS levels (d) pro- at 3rd and 4th carbon while Ferulic acid has one -OCH<sub>3</sub> Therefore identifying natural products. **Scientific Evidence of Rice By-Products for Cancer Prevention** The effects of combinations of polyphenols with chemotherapy and Several studies on human and animal cervical cancer cells proved that polyphenols and mechanism of these natural products may improve the health .. isoflavones, daidzein and its effect on the treatment of cervical cancer in vitro. **The prospective role of plant products in radiotherapy of cancer: a** Radiosensitizing effect of ferulic acid on human cervical carcinoma cells in vitro. tested in two cervical cancer cell lines (HeLa and ME-180) in vitro. The present results show that ferulic acid (FA) enhances radiation effects **Inhibition of cancer antioxidant defense by natural compounds** Oleanolic acid (OA) is a natural pentacyclic triterpenoid radiosensitizing effect of OA on cancer cells by attenuating treatment of radiation with OA significantly decreased the through the inhibition of GSH synthesis in vitro The rat glioma C6 and human . product per min at 25°C. The ?-GCS assay was an adapta-. **The Role of Natural Polyphenols in the Prevention and - MDPI** Bookcover of Ferulic acid modulates radiation effects in cancer cells in vitro Sensitizing effect of natural products on human cancer cells. Research on Woman **Ferulic acid modulates radiation effects in cancer cells in vitro Kelussia odoratissima potentiates cytotoxic effects of radiation in** Ferulic acid modulates radiation effects in cancer cells in vitro. Sensitizing effect of natural products on human cancer cells. LAP LAMBERT **Role of phytochemicals on radiationmodification in normal and** Among natural products, phytochemicals represent the class of compounds that have by which vegetables and fruits affect human cancers are

multiple and complex. acid, curcumin and ferulic acid [ 12 ], or resveratrol and ursolic acid [ 13 ]. . The predominance of aerobic glycolysis in cancer cells, the Warburg effect **South Asian Medicinal Compounds as Modulators of Resistance to** In: Natural Products and their Active Compounds cancer cell killing while at the same time minimizing the damage to normal cells dietary phytochemicals, namely, ferulic acid, curcumin, sesamol, lycopene . apigenin on radiation-induced chromosomal damage in human lymphocytes radioprotective effects against. **Cancer Chemoprevention by Phytochemicals: Natures - MDPI** Our result showed the extract increased the radiation effect. This observation may be related to the presence of active compounds such as phthalides and ferulic acid. Natural products are active compounds used for treatment of diseases since Human cervical cancer cell line (HeLa) was bought from Pasteur Institute **Cancers Free Full-Text South Asian Medicinal Compounds as** Many natural products have the ability to sensitize cancer cells to These side effects highlight the lack of selectivity of chemotherapy [11]. One of the consequences of the excessive damage caused by ROS are .. Moreover, bioactive compounds of curcumin degradation such as ferulic acid and vanillin **PDF (584 K) 2013?7?26?** Ferulic acid modulates radiation effects in cancer cells in vitro. Sensitizing effect of natural products on human cancer cells. LAP LAMBERT **Full-Text PDF - MDPI** This paper is mainly focused on studies on cytotoxic effects on cancer cell lines. oxidative damage, membrane alteration and damage to nucleic acid in various human cell lines. . radiosensitizing effect in combination with radiation and drugs acting through modulation of Natural Products as Potential Radiosensitizers **An overview on the role of dietary phenolics for the treatment of** The substrates in effect sensitize cancer cells to chemotherapeutic agents. Betulinic acid can overcome resistance or cross-resistance effectively. . Because natural products have fewer side effects, they are increasingly being used .. human ovarian cancer cells to paclitaxel-induced apoptosis in vitro.

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