

1: Nutr Cancer. 2004;50(1):1-7.

Dietary flavonoids and cancer risk: evidence from human population studies.

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High dietary intake of fruits and vegetables is consistently associated with a reduced risk of common human cancers, including cancers of the lung, breast, prostate, and colon. It is unknown which bioactive compound or compounds in plant foods provide the chemoprotective effects. One class of compounds currently under investigation is flavonoids, a large group of compounds with similar structure, consisting of two phenolic benzene rings linked to a heterocyclic pyran or pyrone. Although there are numerous in vitro and animal model data suggesting that flavonoids influence important cellular and molecular mechanisms related to carcinogenesis, such as cell cycle control and apoptosis, there are limited data from human population studies. This article reviews data from four cohort studies and six case-control studies, which have examined associations of flavonoid intake with cancer risk. There is consistent evidence from these studies that flavonoids, especially quercetin, may reduce the risk of lung cancer. Further research using new dietary databases for food flavonoid content is needed to confirm these findings before specific public health recommendations about flavonoids can be formulated.

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2: Cancer Lett. 2008 Oct 8;269(2):315-25. Epub 2008 May 7.

Multitargeted cancer prevention by quercetin.

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Quercetin is an anti-oxidative flavonoid widely distributed in the plant kingdom. Phenolic hydroxyl groups at the B-ring and the 3-position are responsible for its free radical-scavenging activity. Quercetin is commonly present as a glycoside and is converted to glucuronide/sulfate conjugates during intestinal absorption and only conjugated metabolites are therefore found in circulating blood. Although metabolic conversion attenuates its

biological effects, active aglycone may be generated from the glucuronide conjugates by enhanced beta-glucuronidase activity during inflammation. With respect to its relationship with molecular targets relevant to cancer prevention, quercetin aglycone has been shown to interact with some receptors, particularly an aryl hydrocarbon receptor, which is involved in the development of cancers induced by certain chemicals. Quercetin aglycone has also been shown to modulate several signal transduction pathways involving MEK/ERK and Nrf2/keap1, which are associated with the processes of inflammation and carcinogenesis. Rodent studies have demonstrated that dietary administration of this flavonol prevents chemically induced carcinogenesis, especially in the colon, whilst epidemiological studies have indicated that an intake of quercetin may be associated with the prevention of lung cancer. Dietary quercetin is, therefore, a promising agent for cancer prevention and further research is warranted.

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Induction of cancer-specific cytotoxicity towards human prostate and skin cells using quercetin and ultrasound

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Abstract

Bioflavonoids, such as quercetin, have recently emerged as a new class of chemotherapeutic drugs for the treatment of various cancer types, but are marred by their low potency and poor selectivity. We report that a short application of low-frequency ultrasound selectively sensitises prostate and skin cancer cells against quercetin. Pretreatment of cells with ultrasound (20 kHz, 2 W cm⁻², 60 s) selectively induced cytotoxicity in skin and prostate cancer cells, while having minimal effect on corresponding normal cell lines. About 90% of the viable skin cancer cell population was lost within 48 h after ultrasound-quercetin (50 M) treatment. Ultrasound reduced the LC₅₀ of quercetin for skin cancer cells by almost 80-fold, while showing no effect on LC₅₀ for nonmalignant skin cells.