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Investigation of the biochemical mechanism of action of antioxidants in the prevention of cancer

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Background: The safe use of medicines is a critical issue for all health care professionals; cancer refers to a group of diseases that are associated with a disturbance in the control of cell growth and metabolism. Indeed, the unbalanced control of cellular proliferation is a primary characteristic of cancer cells and, as such, any molecule capable of inhibiting cancer cell proliferation may also be useful as a potential chemo-preventive agent. Throughout history, antioxidants have been the most significant source of anticancer and chemoprevention agents. More than 1,000 different phytochemicals are already proved to possess interesting chemoprevention activities. Antioxidants consists of a wide variety of biologically active phytochemicals including phenolics, flavonoids, carotenoids, etc. that have been shown to suppress early and late stages of carcinogenesis.

Objective: The objective of this review is to know the recent biochemical and molecular mechanisms, in relation to natural and synthetic chemoprevention substances (antioxidants) for cancer control and management.

Major Findings: Antioxidants exert anticancer effects via. a variety of mechanisms, including removal of carcinogenic agents, modulation of cancer cell signalling and cell cycle progression, promotion of apoptosis and modulation of enzymatic activities.

Conclusion: This review provides an updated and comprehensive overview on the anticancer effects of antioxidants *in-vitro* and *in-vivo* animal models including recent intervention studies. Finally, possible mechanisms of action involving antioxidant and pro-oxidant activity, as well as, interference with cellular functions are discussed.'

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