

## Significance of Nutraceuticals in Cancer Therapy

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### ABSTRACT

Bioactive components are naturally occurring substances that are highly effective and efficient in 'targeted therapy via molecular binding' and could result in the prevention of various degenerative disorders like cancer, by inhibiting certain enzymes or progression of specific molecular pathways. Nutraceuticals, specifically elicit interest as they are free of toxicity and also have added health benefits. The majority of the well-known nutraceuticals are phytochemicals. Even though the mainstay for cancer treatment, currently available chemotherapy regimens fail to accomplish their maximum therapeutic efficacy due to the emergence of acquired and intrinsic chemoresistance. Recent studies have shown that nutraceuticals can influence various molecular signaling pathways leading to multistage carcinogenesis as well as chemoresistance. Most of these molecules exert anti-cancer effects by epigenetic mechanisms and as a result of these precise mechanisms, nutraceuticals can influence epigenetic changes in cancer, their cellular targets. Moreover, most cancers develop resistance to chemotherapeutic drugs like in the case of cervical cancer which is an HPV-related malignancy. Hence a novel therapeutic strategy against cancer, using the potentiality of a nutraceutical is required. However, due to their poor solubility and bioavailability, they have not been harnessed to their full potential, and therefore the design of novel food matrices is of prime importance. Ideally, nutraceuticals are extracted from their natural source and are later incorporated into functional foods with the help of drug delivery systems. This review provides an overview of the relevance of various nutraceuticals in cancer treatment together with their usefulness as chemopreventives and chemosensitizers.

**Keywords:** Bioactive components; Nutraceuticals; Anti-cancer; Targeted therapy; Drug delivery

