

## Therapeutic and Preventive Potential of Functional Food and Cancer

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### Editorial

Functional foods with intrinsic mixture of bioactive anti-cancer compounds could be very effective medium to contain menace caused by cancer. The health promoting effect of fruits and vegetable is indisputable. The primary role of diet is to provide sufficient nutrients to meet the nutritional requirements of an individual. There is now increasing scientific evidence to support the hypothesis that some foods and food components have beneficial physiological and psychological effects over and above the provision of the basic nutrients. Functional foods are foods that have a potentially positive effect on health beyond basic nutrition. Proponents of functional foods say they promote optimal health and help reduce the risk of disease. The concept of Foods for Specified Health Use (FOSHU) was established in Japan in 1919. Foods identified as FOSHU must be approved by the Minister of Health and Welfare after the submission of comprehensive science-based evidence to support the claim for the foods when they are consumed as part of an ordinary diet. In the United States the functional foods are not officially recognized as a regulatory category by the American Food and Drug Administration (FDA). The European Commission Concerted Action on Functional Food Science in Europe (FUFOSE) regards a food as functional if it is satisfactorily demonstrated to affect beneficially one or more target functions of the body, in a way that it is relevant to an improved state of health and well-being and/or a reduction of disease risk, beyond adequate nutritional effects.

Numerous plant foods or physiologically active ingredients derived from plants have been investigated for their role in disease prevention and health. Some plant-based foods or food constituents currently do not have approved health claims, but have growing clinical research supporting their potential health benefits, and thus would be described as having moderately strong evidence [1].

Cancer is now second most common cause of deaths globally as per the estimates provided by the Global Burden of Disease (GBD) 2013. In 2013 there were 14.9 million incident cancer cases, and 8.2 million deaths caused by cancer. Dietary habit is critically linked with development of cancer, diet with low whole grains is regarded as main factor for development of various cancers. The importance of food in cancer prevention is well documented [2,3]. Food invariably is source of various nutrients, however, certain foods goes beyond their basic function of providing nutrients and are known to possess health enhancing properties. Such foods with health promoting activity are commonly known as 'Functional Foods'. There has been numerous evidence based studies about effectiveness of functional food's cancer-therapeutic and/or -preventive potential. Dietary factors causally linked with various cancers are high calorie fatty foods (breast cancer), salted food (stomach cancer), low fruits and vegetable intake (breast, oral and lung cancer), red meat consumption (colon, breast and

pancreatic cancer) and low fibre diet (colon cancer). There has been numerous evidence based studies about effectiveness of functional food's cancer therapeutic and/or preventive potential. The risk of developing cancer is reduced by half in people consuming diets high in fruits and vegetables when compared with those consuming diets with less fruits and vegetables. The potential anti carcinogenic indian foods include that vitamin C, vitamin A, vitamin E, selenium, allium plants, soybean, cruciferous vegetables, flax seeds and dietary fibers. The major vegetables include broccoli, cauliflower, radish, kale, brussels sprouts, watercress and cabbage that are used either fresh or cooked. They are all anticancer for having a lot of vitamins from vegetables but are easily destroyed after cooking. Daily multivitamin supplementation modestly but significantly reduces the risk of total cancer. Cereals (rice, barley, wheat) are major source of nutrition globally and whole grains have been reported to possess cancer preventive property. Its cancer preventive activity can be attributed to 'lunasin' which is a cancer preventive, anti-inflammatory and cholesterol- reducing peptide found in cereals. Bran is the hard outer layer of cereal grains which accounts for 10%, rich in a myriad of phytochemicals with anticancer viz. phenolics, flavonoids, glucans and pigments. Twelve sphingolipids from wheat bran extract showed little growth inhibition against human colon cancer cell lines in vitro [4]. The antitumor effects of mushrooms have been reported for breast cancer, colon cancer, gastric cancer, prostate cancer, pancreatic cancer, cervical and ovarian as well as endometrial cancer. The anti-cancer activity can be mainly attributed to constituents' biopolymers. Higher consumption of fruit improves protection for maintaining human health against oxidative damage that may play a role in carcinogenesis and some chronic diseases, namely oxidative damage and lipid peroxidation. Citrus fruits have been reported to possess potential anti-cancer activity which can be attributed to presence of bioactive compounds like limonene and flavonoids such as quercetin, myricetin, rutin, tangeritin, naringin and hesperidin. Pomegranate has been reported to be effective in prevention of colon, prostate, and breast cancer because of hydroxycinnamic acids found in all parts of fruit. Ellagic acid and resveratrol are found in grape skin, berries and red wine which are known to have anti-inflammatory activity and inhibit synthesis of prostaglandins stimulating tumor cell growth. Probably the most intensively investigated class of physiologically-active components derived from animal products are the (n-3) fatty acids, predominantly found in fatty fish such as salmon, tuna, mackerel, sardines and herring.

Dietary habit is critically linked with development of cancer; diet with low whole grains is regarded as main factor for development of various cancers. However, the difficulty in establishing the association of dietary factors with cancer development is attributed to limitations in the methodology to a certain factor, a weakness to define the effect of each dietary ingredient separately and a possible interaction

between them. Future studies are warranted to establish composition of these functional foods in our diet for prevention and treatment of cancer. Scientific endeavours should focus on searching right combination of these health promoting foods, along with adaptation of healthy life-style.

## References

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