

## **Tea polyphenols, their biological effects and potential molecular targets**

Tea is the most popular beverage in the world, second only to water. Tea contains an infusion of the leaves from the *Camellia sinensis* plant rich in polyphenolic compounds known as catechins, the most abundant of which is (-)-EGCG. Although tea has been consumed for centuries, it has only recently been studied extensively as a health-promoting beverage that may act to prevent a number of chronic diseases and cancers. The results of several investigations indicate that green tea consumption may be of modest benefit in reducing the plasma concentration of cholesterol and preventing atherosclerosis. Additionally, the cancer-preventive effects of green tea are widely supported by results from epidemiological, cell culture, animal and clinical studies. In vitro cell culture studies show that tea polyphenols potently induce apoptotic cell death and cell cycle arrest in tumor cells but not in their normal cell counterparts. Green tea polyphenols were shown to affect several biological pathways, including growth factor-mediated pathway, the mitogen-activated protein (MAP) kinase-dependent pathway, and ubiquitin/proteasome degradation pathways. Various animal studies have revealed that treatment with green tea inhibits tumor incidence and multiplicity in different organ sites such as skin, lung, liver, stomach, mammary gland and colon.

Recently, phase I and II clinical trials have been conducted to explore the anticancer effects of green tea in humans. A major challenge of cancer prevention is to integrate new molecular findings into clinical practice. Therefore, identification of more molecular targets and biomarkers for tea polyphenols is essential for improving the design of green tea trials and will greatly assist in a better understanding of the mechanisms underlying its anti-cancer activity.

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