

Cite this as: Zong-mao CHEN, Zhi LIN, 2015. Tea and human health: biomedical functions of tea active components and current issues. *Journal of Zhejiang University-Science B (Biomedicine & Biotechnology)*, **16**(2):87-102. [doi:10.1631/jzus.B1500001]

Tea and human health: biomedical functions of tea active components and current issues

Key words: Tea, Cancer, Metabolic syndrome,
Cardiovascular disease, Neurodegenerative disease,
Bioavailability

Review Summary

Cancer prevention activities of tea catechins in different organ sites



Strong evidence on animal models

No explicit results in epidemiological studies in humans



Not consistent

Reason:

Extremely low bioavailability of the tea catechin in human target sites (only 0.2-2% of the ingested EGCG amount after 90 min illustrating)

Possible solving strategies

- 1) Structure modification to improve the bioavailability of tea catechin;
- 2) Nanochemoprevention: Change of formulation to make the more catechin in the target sites.

Points for attention

Unexpected toxicity of high concentration of tea polyphenol extracts used as dietary supplement has been reported since the close of the last century.

A total of 79 cases of induced liver disease were reported in PubMed from January 1966 to June 2007.

In 2008, 218 reports on green tea extracts were analyzed by the US Pharmacopeia. It was concluded that the consumption of highly concentrated green tea extracts in an empty stomach was more likely to lead to adverse effects

US Dietary Supplement Information Expert Committee (DSIEC) suggested that green tea is a very popular beverage and yet seldom shows liver toxicity, and listed it in a safety level of 2.

It was safe even at a very high dosage of 2500 mg/(kg·d), which corresponds to a human weighing 60 kg taking 150 g green tea extracts daily (Saleh *et al.*, 2013)

It is recommended that green tea extracts not be taken on empty stomach for the safety of consumers.