Cancer chemoprevention with green tea catechins by targeting receptor tyrosine kinases.


Source

Department of Gastroenterology, Gifu University Graduate School of Medicine, Gifu, Japan. shimim-gif@umin.ac.jp

Abstract

Recent studies indicate that receptor tyrosine kinases (RTKs), which play important roles in cell proliferation, are one of the possible targets of green tea catechins (GTCs) in cancer cell growth inhibition. (-)-Epigallocatechin-3-gallate (EGCG), the major catechin in green tea, inhibits cell proliferation and induces apoptosis in various types of cancer cells, including colorectal cancer and hepatocellular carcinoma cells, by blocking the activation of the epidermal growth factor receptor (EGFR) family of RTKs. EGCG inhibits the activation of insulin-like growth factor-1 receptor (IGF-1R) and VEGFR2, the other members of the RTK family, and this effect is also associated with the anticancer and chemopreventive properties of this agent. EGCG suppresses the activation of EGFR in part by altering membrane lipid organization and causing the subsequent inhibition of the dimerization and activation of this receptor. Preliminary trials have shown that GTCs successfully prevent the development and progression of precancerous lesions, such as colorectal adenomas, without causing severe adverse effects. The present report reviews evidence indicating that GTCs exert anticancer and chemopreventive effects by inhibiting the activation of specific RTKs, especially EGFR, IGF-1R, and VEGFR2, and concludes that targeting RTKs and their related signaling pathways by using tea catechins could be a promising strategy for the prevention of human cancers.

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