

# Tea epigallocatechin-3-gallate inhibits cell proliferation in breast cancer patients

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(Medical Xpress) -- Erxi Wu, assistant professor of pharmaceutical sciences, and Fengfei Wang, research associate of pharmaceutical sciences, co-wrote the article, "Anti-cancer activities of tea epigallocatechin-3-gallate in breast cancer patients under radiotherapy," which will be published by *Current Molecular Medicine*.

In the study, they tested the hypothesis that administration of epigallocatechin-3-gallate, a polyphenol present in abundance in widely consumed [tea](#), inhibits [cell proliferation](#), invasion and angiogenesis in [breast cancer patients](#). Epigallocatechin-3-gallate in 400 mg capsules was orally administered three times daily to breast cancer patients undergoing treatment by radiotherapy. Parameters related to cell proliferation, invasion and angiogenesis were analyzed while blood samples were collected at different time points to determine efficacy of the treatment.

Compared to patients who received radiotherapy alone, those given radiotherapy plus epigallocatechin-3-gallate for an extended time period (two to eight weeks) showed significantly lower serum levels of vascular endothelial growth factor, hepatocyte growth factor and reduced activation of metalloproteinase-9 and metalloproteinase-2. Addition of sera obtained from patients treated by combination of radiotherapy and epigallocatechin-3-gallate feeding for two to eight weeks to in vitro cultures of highly-metastatic human MDA-MB-231 breast cancer cells resulted in the following significant changes: (1) suppression of cell proliferation and invasion; (2) arrest of cell cycles at the G0/G1 phase;

(3) reduction of activation of MMP9/MMP2, expressions of Bcl-2/Bax, c-Met receptor, NF- $\kappa$ B and the phosphorylation of Akt. MDA-MB-231 cells exposed to 5-10  $\mu$ M epigallocatechin-3-gallate also showed significant augmentation of the apoptosis inducing effects of g-radiation, concomitant with reduced NF- $\kappa$ B protein level and AKT phosphorylation.

“This is the first study to use EGCG in human breast cancer patients. Our results provide hitherto unreported evidence that EGCG potentiated efficacy of [radiotherapy](#) in breast [cancer patients](#), and raise the possibility that this tea polyphenol has potential to be a therapeutic adjuvant against human metastatic breast cancer,” Wu said. They collaborated with Guoying Zhang’s lab from Yantai University, China. “We have established a close collaboration with the Zhang lab in finding anticancer drugs and elucidating the mechanisms of the targeted therapy for [breast cancer](#), the second leading cause of cancer-related deaths in women in the United States,” Wu said.

Provided by North Dakota State University

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