

Enhancement of (-)-epigallocatechin-3-gallate and theaflavin-3-3'-digallate induced apoptosis by ascorbic acid in human lung adenocarcinoma SPC-A-1 cells and esophageal carcinoma Eca-109 cells via MAPK pathways.

[Gao Y](#)¹, [Li W](#), [Jia L](#), [Li B](#), [Chen YC](#), [Tu Y](#).

[Author information](#)

Abstract

Tea polyphenols (-)-epigallocatechin-3-gallate (EGCG) and theaflavin-3-3'-digallate (TF3) are two prospective compounds in cancer prevention and treatment. Ascorbic acid (Vc) is essential to a healthy diet as well as being a highly effective antioxidant. In this work, the effects of the combination of EGCG or TF3 with Vc on the apoptosis and caspases-3/9 activities in human lung adenocarcinoma SPC-A-1 cells and esophageal carcinoma Eca-109 cells were determined. Furthermore, the role of mitogen-activated protein kinases (MAPK) pathways in the apoptosis induced by TF3 or EGCG together with Vc were studied using three MAPK inhibitors (ERK inhibitor PD98059, JNK inhibitor SP600125 and p38 inhibitor SB203580). Our results showed that Vc could enhance the EGCG and TF3 induced apoptosis in SPC-A-1 and Eca-109 cells, and this effect involved the activation of caspase-3 and 9. EGCG, TF3 and Vc could activate MAPK pathways respectively, and each compound activated different MAPK subfamilies in different cells. This may explain the enhancement of EGCG and TF3 induced apoptosis by Vc in SPC-A-1 and Eca-109 cells, and will ultimately aid the design of more effective anti-cancer treatments.