Inhibitory effect of (-)-epicatechin 4-benzylthioether on the growth of glioma cells in culture.

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Abstract

The effect of (-)-epicatechin 4-benzylthioether (EC-BE) on the growth of cultured rat glioma cells was investigated. EC-BE was found to produce a concentration-dependent inhibitory effect on the growth of glioma cells. Inhibition was also observed in samples treated with (-)-epicatechin acetoxymethyl ester (EC-AM). The original compound (-)-epicatechin, which gave rise to EC-AM and EC-BE, failed to produce a similar result. Because both EC-BE and EC-AM are membrane permeable, while (-)-epicatechin is not, the results indicated that the (-)-epicatechin and its derivatives need to be intracellular in order to produce an effect. Moreover, it is demonstrated that EC-BE inhibited the incorporation of [3H]thymidine into DNA while the uptake of extracellular [3H]thymidine by glioma cells was not affected. The activities of redox enzymes such as glutathione peroxidase and glutathione reductase were attenuated in cells treated with EC-BE. These data suggest that EC-BE can inhibit the growth of glioma cells by affecting a redox pathway related to the formation of DNA.