Cinnamophilin as a novel antiperoxidative cytoprotectant and free radical scavenger.

許準榕
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Abstract

The antioxidant properties of cinnamophilin were evaluated by studying its ability to react with relevant reactive oxygen species, and its protective effect on cultured cells and biomacromolecules under oxidative stress. Cinnamophilin concentration-dependently suppressed nonenzymatic iron-induced lipid peroxidation in rat brain homogenates with an IC50 value of 8.0 þ 0.7 WM and iron ion/ADP/ascorbate initiated rat liver mitochondrial lipid peroxidation with an IC50 value of 17.7þ 0.2 WM. It also exerted an inhibitory activity on NADPH-dependent microsomal lipid peroxidation with an IC50 value of 3.4 þ 0.1 WM without affecting microsomal electron transport of NADPH-cytochrome P-450 reductase. Both 1,1-diphenyl-2-picrylhydrazyl and 2,2P-azo-bis(2-amidinopropane) dihydrochloride-derived peroxyl radical tests demonstrated that cinnamophilin possessed marked free radical scavenging capacity. Cinnamophilin significantly protected cultured rat aortic smooth muscle cells (A7r5) against alloxan/iron ion/H2O2-induced damage resulting in cytoplasmic membranous disturbance and mitochondrial potential decay. By the way, cinnamophilin inhibited copper-catalyzed oxidation of human low-density lipoprotein, as measured by fluorescence intensity and thiobarbituric acid-reactive substance formation in a concentration-dependent manner. On the other hand, it was reactive toward superoxide anions generated by the xanthine/xanthine oxidase system and the aortic segment from aged spontaneously hypertensive rat. Furthermore, cinnamophilin exerted a divergent effect on the respiratory burst of human neutrophil by different stimulators. Our results show that cinnamophilin acts as a novel antioxidant and cytoprotectant against oxidative damage. ß 2001 Elsevier Science B.V. All rights reserved.