

A Study on the Inhibition of Oxidative Damage of Biological Membranes Induced by Active Oxygens and Free Radicals

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There is now an increasing number of experimental and epidemiological evidence which indicates that the oxidations of biological molecules and membranes induced by active oxygens and free radicals are involved in a variety of pathological events, cancer and even aging processes. The aerobic organisms are protected against these oxidative stress by an array of defense systems with different functions. Among others, the radical-scavenging antioxidants play an important role to inhibit a chain initiation and break the chain propagation. This study has been performed aiming at elucidating the dynamics and mechanism of action of various natural and synthetic radical-scavenging antioxidants, especially the effect of reaction medium on them. A number of aminophenols, chromanols and related compounds have been studied in homogeneous solution, micelle, liposomal membranes and in ex vivo systems. The antioxidant activities of various natural and synthetic carbazoles were studied in the oxidations of methyl linoleate in homogeneous solution and soybean phosphatidylcholine liposomes in aqueous dispersions induced by free radicals. Carazostatm, 1-heptyl-3-hydroxy-2-methyl carbazole, which was isolated from a culture of *Streptomyces Chromofuscus* was found to be a strong antioxidant in both oxidation systems. It was also found that the physical factors such as location and mobility of antioxidant in the microenvironment as well as chemical reactivity toward radicals are important in determining the overall antioxidant potency.