

Subadditive Interactions between Antioxidants in the Protection against Lipid Peroxidation

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Synergistic interactions between antioxidants have been postulated but not proven. On the contrary, it has been reported that the antioxidant activity of mixtures of antioxidants can be lower than the sum of the antioxidant activities of individual components. We report that such a situation can be observed in 2,2'-azobis(2-amidinopropane) dihydrochloride (AAPH)-treated phosphatidylcholine liposomes in which lipid peroxidation was monitored by oxidation of 4,4-difluoro-5-(4-phenyl-1,3-butadienyl)-4-bora-3a,4a-diaza-s-indacene-3-undecanoic acid (C₁₁-BODIPY^{581/591}). Glutathione, present inside liposomes, and hydrophobic antioxidants, present in the lipid bilayer, protected against lipid peroxidation, but their simultaneous action was lower than the sum of individual contributions. A possible explanation for this effect is proposed.

Key words: Lipid Peroxidation, Antioxidants, Liposomes, Glutathione