

Effects of antioxidants and haemoglobin status on the t-butyl hydroperoxide-induced oxygen uptake by red blood cells

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Oxygen uptake by erythrocytes exposed to t-butyl hydroperoxide (t-BHP) exhibited an induction period. The rate of oxygen consumption can be reduced by antioxidants and blood plasma. The induction time was not appreciably modified by the antioxidants tested, however, plasma increased it by a factor of two. The in vivo pretreatment with diethyl maleate (0.6 g kg⁻¹) produced increased rates of oxygen uptake without changes in the induction period, while vitamin E (12.5 mg kg⁻¹) elicited lower oxygen consumption rates and longer induction times, compared to those observed in cells from control rats upon addition of the hydroperoxide. These results suggest that the antioxidants tested on the t-BHP lipid peroxidation in erythrocyte suspensions act as inhibitors and/or retarders of the process. Furthermore, lipid peroxidation induced in these conditions seems to depend upon the haemoglobin status of the cells as oxygen uptake, malondialdehyde production and chemiluminescence were significantl