

# **The in vitro antioxidant activity of lipid related natural substances as measured by enhanced chemiluminescence**

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摘要

## **Abstract**

There is abundant evidence for the premise that oxygen-derived free radicals (OFR) mediate ischemia/reperfusion injury to the myocardium. OFR scavengers such as superoxide dismutase can effectively reduce damage through lipid peroxidation during ischemia/reperfusion. Enhanced chemiluminescence, which has been used to measure OFR, was used to measure the antioxidant activity of fatty acids (palmitic and linoleic acid) and triglycerides (triolein, tristearin) and natural plant antioxidants (magnolol, catechin, trilinolein). Trilinolein, which has recently been isolated from natural products, as well as the well-known water soluble analogue of vitamin E -Trolox, were used as control. During pretreatment with chemicals, at concentrations of  $10^{-9}$  to  $10^{-7}$  M, enhanced chemiluminescence of linoleic acid (C 18:2) showed a dose-responsive reduction of OFR with a maximal mean reduction of -31.9 % when compared to baseline. A saturated fatty acid such as palmitic acid (C 16:0) showed only relatively weak antioxidant activity at concentrations of  $10^{-7}$  to  $10^{-6}$  M with a maximum reduction of OFR of 15.2 % only. Control chemicals such as trilinolein and Trolox showed significant antioxidant activity. At concentrations between  $10^{-10}$  and  $10^{-6}$  M and trilinolein has the most potent antioxidant activity with a maximal mean reduction of OFR of 48.0%, whereas Trolox showed only -39.2 %. As for the natural plant antioxidants, only catechin showed potent antioxidant activity (-40 %). Polyunsaturated triglycerides such as triolein (oleic acid, C 18:1) also possess significant OFR scavenging effect (- 31.9 %) whilst saturated triglycerides such as tristearin (stearic acid, C 18:0) had only relatively weak antioxidant activity (- 15.2 %). Generally, the antioxidant activity of unsaturated compounds is stronger than saturated compounds; double-bond existence may partially explain this phenomenon. [References: 39]