

# The Relation between the Antioxidant and Prooxidants and Its Effects on Chronic Diseases

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## Editorial

Regular chewing of tobacco along with inadequate diet is the most prominent finding to mortality due to lung cancer in USA [1]. Diets rich in fruit and vegetables have been reported to exert a protective effect against a variety of diseases, particularly the cardiovascular disease and cancer [2]. The primary nutrients thought to provide protection afforded by fruit and vegetables are the antioxidants [3]. There are tens of thousands of different types of polyphenols, so our understanding of each is limited and therefore, it's possible and even likely that there are many others which can have a strong pro-oxidant effect that have yet to be identified.

I need to start the current article with some questions such as a) Are antioxidants good? b) Are prooxidants bad?

In this concern, No absolute answers for the mentioned question. Antioxidants are chemicals that interact with and neutralize free radicals, thus preventing them from causing damage. Antioxidants are also known as "free radical scavengers." Pro-oxidants do the opposite of antioxidants. Instead of neutralizing free radicals, they promote their formation.

**A. Oxidative stress:** Alcohol, smoking, unhealthy sun exposure, anxiety, and even loud noise all act as pro-oxidants, as they all trigger ROS generation. With the sun, it's limited more to the skin and eyes. With loud noise,

free radicals form in the inner ear (lateral wall, organ of Corti, and auditory nerve) which accelerate hearing loss. Oxidative stress is a normal phenomenon in the body. Under normal conditions, the also be viewed as an imbalance between the prooxidants and antioxidants in the body (Figure 1). For the last two decades, oxidative stress has been one of the very important and most burning topics among the scientific researchers all over the world.

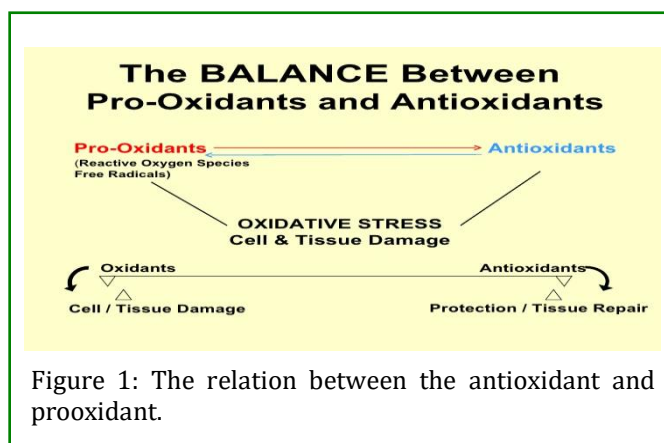
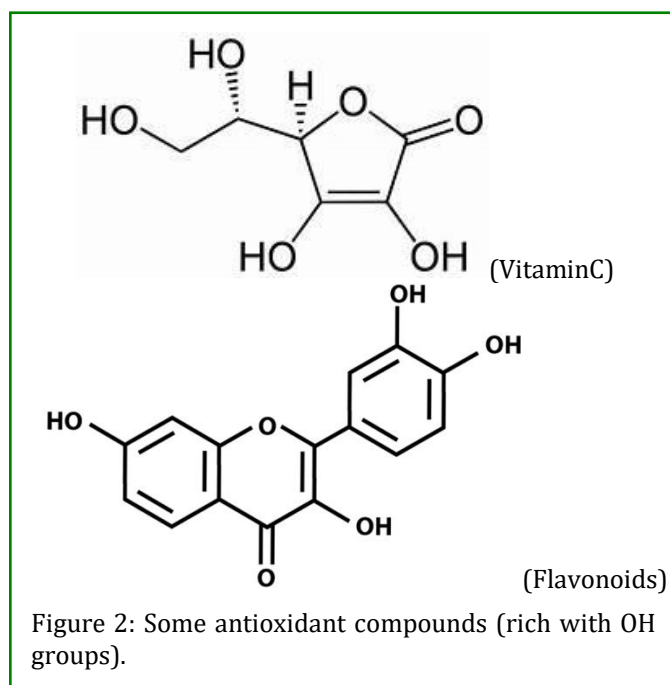


Figure 1: The relation between the antioxidant and prooxidant.

**B. The relation between prooxidant and antioxidant:** As the results obtained by George et al. [4] who mentioned that some of the antioxidant act as prooxidants by inducing nuclear damage and lipid

peroxidation if transition metal is available. the number of free OH substitutions initiates the prooxidant activity of a flavonoid. The OH exchange is essential for antioxidant properties. But the more OH substitutions give the stronger prooxidant activities [5]. Furthermore, another results mentioned that some antioxidants have both prooxidant and antioxidant effects such as ascorbic acid this depending upon the dose of compound [6]. Also, results reported by Kontush et al. [7] illustrated that the prooxidant/antioxidant activity of carotene and lycopene has also been found to depend on their interaction with biological membrane and other co-antioxidant molecules.



### Can antioxidant supplements help prevent cancer?

In laboratory and animal studies, the presence of increased levels of exogenous antioxidants has been shown to prevent the types of free radical damage that have been associated with cancer development. Therefore, researchers have investigated whether taking dietary antioxidant supplements can help lower the risk of developing or dying from cancer in humans.

Many observational studies, including case-control studies and cohort studies, have been conducted to investigate whether the use of dietary antioxidant supplements is associated with reduced risks of cancer in humans. Overall, these studies have yielded mixed results

[8]. Because observational studies cannot adequately control for biases that might influence study outcomes, the results of any individual observational study must be viewed with caution.

Some parameters can be used for determination the effects of antioxidant compounds as prooxidant on biological cells (cancer cell lines).

- ROS
- Caspase enzymes
- P53, Bax, Bcl2
- Cytochrome C

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