PROGRAMME-BSC BMBT/BBM
PROGRAMME CODE-BSc06/BSc07
COURSE TITLE-ENZYMOLOGY AND BIOENERGETICS
IV SEM COURSE CODE - CMD21006/ CMD21007

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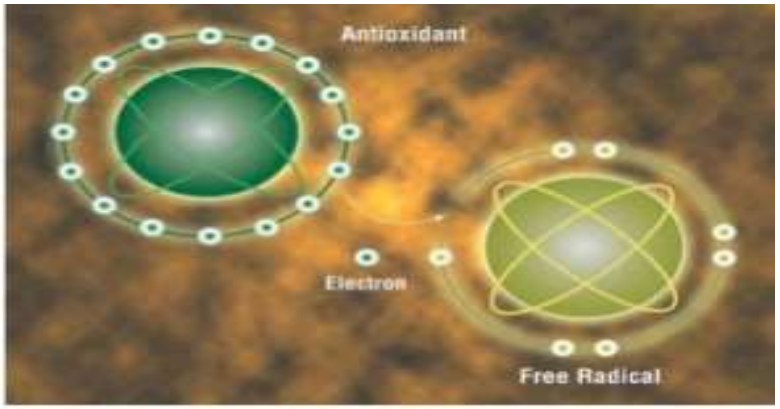
ROS Production and Antioxidant Mechanism

Introduction



An antioxidant is a molecule that inhibits the oxidation of other molecules in human body. Antioxidants protect the body from damage caused by harmful molecules called free radicals. This damage is a factor in the development of blood vessel disease atherosclerosis, cancer and other conditions.

What is a free radical ?

- Free radical is an atom that has at list one unpaired electron.
- Free radical are released are during normal metabolism, as well as by pollution, smoking, radiation & stress ,air pollution, Alcohol intake , Toxins, High blood sugar levels etc.
- Free radicals are also a by product of converting food into energy.
- Under normal circumstance the body keep them in check.

Antioxidant defense system(ADS).

A biological antioxidant may be defined as a substance(present in low concentrations compared to an oxidizable substrate) that significantly delays or inhibits oxidation of a substrate. Substance that neutralize potential ill effect of free radicals are generally grouped in so called a Antioxidant defense system(ADS).

Mode of Antioxidant defense system (ADS)

Antioxidant defense system (ADS) traditionally have been termed.

primary defense system
secondary defense system

Primary defense system

Includes antioxidant compounds like a Vitamin A,E,C and Glutathione and uric acid.

b) AO scavenging enzymes such as peroxidases

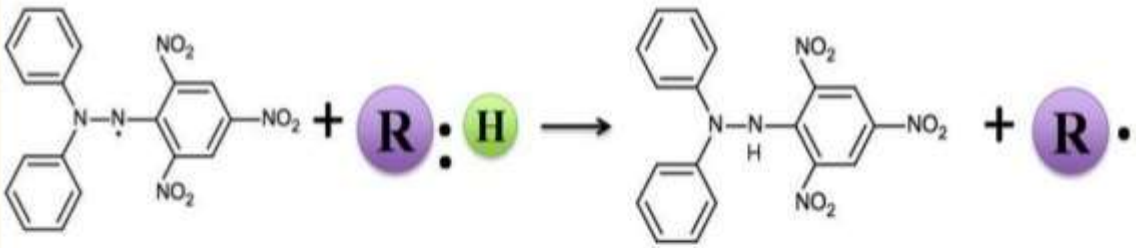
Secondary defense system

Includes Lipolytic enzymes, Phospholipases, proteolytic enzymes and DNA repair enzymes

Some Antioxidant & their mode of action.

VITAMINS	**Alpha tocopherol (Vit E)**	**Breaks lipid peroxidation** Lipid peroxide and O_2^- and OH scavenger	Fat soluble vitamin
	Beta carotene	**Scavenges** OH, O_2^- and peroxy radicals Prevents oxidation of vitamin A **Binds to transition metals**	Fat soluble vitamin
	Ascorbic acid	Directly scavenges O_2^-, OH, and H_2O_2 Neutralizes oxidants from stimulated neutrophils **Contributes to regeneration of vitamin E**	Water soluble vitamin

Example of antioxidant action



DPPH

Purple, 519 nm

DPPH-H

Colorless

R : H represents antioxidant


THANK
YOU