

Biochemical aspects of cellular antioxidant systems

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Aerobic life is characterized by a steady generation of reactive oxygen species balanced by a similar rate of their consumption by antioxidants. To maintain homeostasis, there is a requirement for the continuous regeneration of antioxidant capacity, and if this is not met, oxidative stress occurs, resulting in pathophysiological events. Cellular protection against oxidative stress is organized at multiple levels. Defense strategies include prevention, interception, replacement and repair. These mechanisms are coupled to the intermediary metabolism for a continuous supply of energy, reducing equivalents, and precursors, and depend on the dietary supply of metabolic fuels and essential molecules to allow an optimal cellular functioning.