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P49. THE ROLE OF METAL METABOLISM IN OXIDATIVE STRESS

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Metals are divided into two groups including essential and nonessential, play important roles in biological processes. Changes in metal ion homeostasis can lead to oxidative stress. This instance provides information that gene polymorphisms of enzymes and proteins involved in metal toxicokinetics causes possibly symptomatic effects for numerous diseases including cancer due to playing an important role in metal ion homeostasis. Therefore, there is an important relationship between metal-induced genotoxicity and oxidative stress. Several metals like arsenic (As), cobalt (Co), chromium (Cr), lead (Pb) and copper (Cu) induce redox reactions and the production of reactive oxygen species (ROS). For example, as which is one of the metals with an interest in sulfhydryl groups has a prooxidative effect. As inhibit antioxidative enzymes leads to depletion of intracellular glutathione. In addition, as inhibits the biological activity and great numbers of protein metabolism such as cysteine and metallothionein. Co increases the toxic oxygen radicals by influencing the metabolism of free radicals and causes changes in the catabolic defense enzymes activity. As a result of this, it disrupts the balance of antioxidant. After entering the pulmonary absorption, the reduction of Cr (VI) to Cr(III) may reveal ROS which can lead to DNA damage and oxidative stress. As for lead, it induces damage not only production of ROS but also depletion of the cellular antioxidant pool. Similarly, exposure to copper at high levels decreases glutathione levels. The aim of this review is to provide an overview of metal metabolism related to oxidative stress.

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