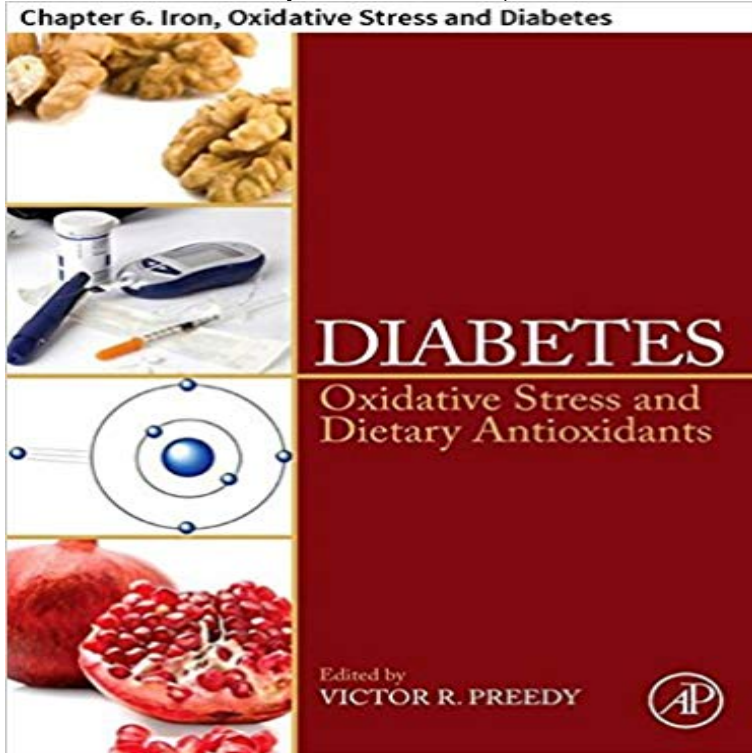


Diabetes: Chapter 6. Iron, Oxidative Stress and Diabetes



Iron is a micronutrient which exists in the redox states Fe^{2+} and Fe^{3+} . The easy transition between the two contributes to its metabolic functions and toxic effects. Iron is normally sequestered by binding to proteins hemoproteins and non-heme iron proteins. Iron homeostasis is maintained by regulation at the levels of dietary uptake and gene expression of iron binding proteins transferrin receptor and ferritin, to prevent the release of catalytically active Fe^{2+} ions. Free iron promotes oxidative stress by generating highly reactive hydroxyl radicals through the Fenton/Haber Weiss reactions, which react with cellular biomolecules, resulting in tissue damage. Diabetes is a metabolic disorder characterized by hyperglycemia and oxidative stress. The elevated iron levels in diabetes also elicit oxidative stress and probably mediate insulin deficiency, insulin resistance, hepatic dysfunction and decreased antioxidant defense systems. Both iron overload and deficiency enhance oxidative stress and promote the prognosis of diabetes and its complications.

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Introduction. Distribution of Iron in the Body. Iron Homeostasis. Oxidative Stress. **Lippincotts Illustrated Reviews: Biochemistry, 5e** Jan 4, 2017 A. Iron metabolism in hemochromatosis, Medicine, vol. . R. C. Cooksey, H. A. Jouihan, R. S. Ajioka et al., Oxidative stress, ?-cell apoptosis, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc, chapter 6, pp.