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Nota di contenuto	Iron Metabolism; Contents; Iron Metabolism Regulation and Iron Storage; Iron and Regulation of Heme Biosynthesis; 1 Iron-dependent regulation of bacterial heme biosynthesis; 1.1 Introduction; 1.2 Summary of heme biosynthetic pathways; 1.3 Mediators of iron-dependent regulation of iron metabolism; 1.4 Regulation of heme synthesis by iron; 2 5-Aminolevulinate synthase and mammalian heme biosynthesis; 2.1 Introduction: 5-aminolevulinate synthase and iron; 2.2 Structure and mechanism: early studies; 2.2.1 Isolation, purification and identification of the PLP cofactor 2.2.2 Steady-state kinetics and mechanism of ALAS2.3 Structure and function: the active site of ALAS; 2.3.1 Identification of the Schiff base linkage between PLP and lysine-313; 2.3.2 Role of a glycine-rich loop as a PLP cofactor-binding site; 2.3.3 Role of aspartate-279 in enhancing the function of PLP and in ALAS catalysis; 2.3.4 Role of tyrosine-121 in the PLP cofactor binding; 2.3.5 Role of arginine-439 in substrate binding; 2.3.6 Active site intersubunit arrangement; 2.4 Conclusions; 3 Ferrochelatase: a new iron sulfur center-containing

enzyme; 3.1 Introduction  
3.2 Identification, purification and characterization of ferrochelatase  
3.3 Steady-state kinetic properties of ferrochelatase; 3.3.1 Ferrochelatase reaction mechanism; 3.3.2 Reducing conditions are not essential for ferrochelatase activity; 3.3.3 Site-directed mutagenesis; 3.3.4 Iron-substrate ligands as determined by Mossbauer spectroscopy; 3.4 The [2Fe-2S] cluster of mammalian ferrochelatases; 3.4.1 Conserved cysteines and iron-sulfur cluster binding; 3.4.2 Spectroscopic characterization of the [2Fe-2S] cluster; 3.5 The three-dimensional structure of *Bacillus subtilis* ferrochelatase  
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5.3.1 Liver  
5.3.2 Barrier tissues; 5.4 Heme- and heme-hemopexin-mediated effects; 5.4.1 Target tissues; 5.4.2 Responses; 5.4.2.1 Interactions between the hemopexin and transferrin systems; 5.5 Biochemical and cellular consequences of heme-hemopexin: comparison with free heme; 5.5.1 Protective role of hemopexin; 5.5.2 Increased oxidation state; 5.5.3 Transcription factors; 5.5.3.1 Redox sensitive; 5.5.3.2 For metallothionein regulation; 5.5.4 Links between iron and copper in iron homeostasis; 5.5.6 Links between heme and copper and cellular homeostasis  
5.5.6.1 Role of copper in certain of the cellular and regulatory effects of hemopexin: intracellular oxidation state

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## Sommario/riassunto

Iron plays a crucial role in many biochemical processes. In recent years intensive research has led to a better understanding of the function of iron in cellular metabolism. In more than twenty articles internationally renowned experts give a thorough account of the recent developments of this fascinating field. The book focuses on the central questions, e.g. transport, storage, and utilization of iron in cells, the three-dimensional structure of iron-containing proteins, the physiological function of heme and iron sulfur-containing proteins, and the regulatory mechanisms in heme biosynthesis

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