

1. Record Nr.	UNINA9910788444503321
Titolo	Iron-sulfur clusters in chemistry and biology // edited by Tracey Rouault
Pubbl/distr/stampa	Berlin, [Germany] ; ; Boston, [Massachusetts] : , : De Gruyter, , 2017 ©2017
ISBN	3-11-047855-2
Edizione	[2. Aufl.]
Descrizione fisica	1 online resource (466 pages) : illustrations
Collana	Iron-Sulfur Clusters in Chemistry and Biology ; ; Volume 1
Disciplina	612.3/924
Soggetti	Trace elements in nutrition
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Frontmatter -- Preface -- Tracey A. Rouault biography -- Contents -- List of contributing authors -- 1. Iron-sulfur proteins: a historical perspective / Bonomi, Francesco / Rouault, Tracey A. -- 2. Chemistry of iron-sulfur clusters / Ichiye, Toshiko -- 3. From the quantum chemistry of iron-sulfur clusters to redox energetics and reaction pathways in metalloenzymes / Noodleman, Louis -- 4. Bioinorganic spectroscopy of iron sulfur proteins- an overview / Guo, Yisong / Li, Jikun -- 5. Quantitative interpretation of EPR spectroscopy with applications for iron-sulfur proteins / Petasis, Doros T. / Hendrich, Michael P. -- 6. The utility of Mössbauer spectroscopy in eukaryotic cell biology and animal physiology / Chakrabarti, Mrinmoy / Lindahl, Paul A. -- 7. The interstitial carbide of the nitrogenase M-cluster: insertion pathway and possible function / Sickerman, Nathaniel S. / Ribbe, Markus / Hu, Yilin -- 8. The iron-molybdenum cofactor of nitrogenase / Spatzal, Thomas / Andrade, Susana L. A. / Einsle, Oliver -- 9. Biotin synthase: a role for iron-sulfur clusters in the radical-mediated generation of carbon-sulfur bonds / Jarrett, Joseph T. -- 10. Molybdenum-containing iron-sulfur enzymes / Hille, Russ -- 11. The role of iron-sulfur clusters in the biosynthesis of the lipoyl cofactor / Lanz, Nicholas D. / Booker, Squire J. -- 12. Iron-sulfur clusters and molecular oxygen: function, adaptation, degradation, and repair / Nicolet, Yvain / Fontecilla-Camps, Juan C. -- 13. Reactivity of iron-sulfur clusters with nitric oxide / Dodd, Erin L. / Crack, Jason C. /

Sommario/riassunto

This volume on iron-sulfur proteins includes chapters that describe the initial discovery of iron-sulfur proteins in the 1960s to elucidation of the roles of iron sulfur clusters as prosthetic groups of enzymes, such as the citric acid cycle enzyme, aconitase, and numerous other proteins, ranging from nitrogenase to DNA repair proteins. The capacity of iron sulfur clusters to accept and delocalize single electrons is explained by basic chemical principles, which illustrate why iron sulfur proteins are uniquely suitable for electron transport and other activities. Techniques used for detection and stabilization of iron-sulfur clusters, including EPR and Mossbauer spectroscopies, are discussed because they are important for characterizing unrecognized and elusive iron sulfur proteins. Recent insights into how nitrogenase works have arisen from multiple advances, described here, including studies of high-resolution crystal structures.

---