

Metal Ions In Biological Systems High Molecular Complexes

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The Ubiquitous Roles of Cytochrome P450 Proteins Astrid Sigel 2007-04-30 Helmut Sigel, Astrid Sigel and Roland K.O. Sigel, in close cooperation with John Wiley & Sons launch a new Series "Metal Ions in Life Sciences". There exists a whole range of books on Cytochromes P450, but none with the focus of this volume. This new volume in the Series concentrates on current hot topics in the area and tries to work out the underlying common developments. As a result the reader will find a systematic account of new results in this exciting research area. The table of contents gives an idea on the wide span of chapters, starting with overviews and the presentation of specific systems, and ending with chapters on carbon-carbon bond cleavage by P450 systems, drug metabolism as catalyzed by P450 systems, decomposition of xenobiotics by P450 enzymes and design and engineering of new P450 systems.

Metal Ions in Toxicology: Effects, Interactions, Interdependencities Astrid Sigel 2015-07-24 Volume 8, solely

devoted to the toxicology of metals and metalloids as well as their compounds, focuses on human health. Not surprisingly, all related research areas are rapidly developing due to the role of metals and metalloids in the environment, for the work place, for food and water supply, etc. Written by 40 internationally recognized experts, the 14 stimulating chapters provide an authoritative and timely resource for scientists working in the wide range from analytical, physical, inorganic, and environmental biochemistry all the way through to toxicology, physiology, and medicine. Volume 8 highlights, supported by nearly 1900 references, in a comprehensive and timely manner the principles of risk assessment regarding the effects of metals on human health. It examines how metal ions and their compounds affect the pulmonary, cardiovascular, gastrointestinal (including liver), hematological, immune, and neurological systems, the kidney, skin and eyes, as well as human reproduction and development. MILS-8 terminates with the role of metal ions as endocrine disrupters, in genotoxicity, and cancer

risk.

Metal Ions In Biological Systems, Volume 44 Helmut Sigel
2005-03-01 Volume 44, devoted solely to the vital research areas concerning the biogeochemistry of metals and their transport in the environment and availability to living systems, offers 9 timely and authoritative chapters on these fascinating topics by 19 internationally recognized experts.

Metallomics and the Cell Lucia Banci 2013-04-18 Metallomics and the Cell provides in an authoritative and timely manner in 16 stimulating chapters, written by 37 internationally recognized experts from 9 nations, and supported by more than 3000 references, several tables, and 110 illustrations, mostly in color, a most up-to-date view of the "metallomes" which, as defined in the "omics" world, describe the entire set of biomolecules that interact with or are affected by each metal ion. The most relevant tools for visualizing metal ions in the cell and the most suitable bioinformatic tools for browsing genomes to identify metal-binding proteins are also presented. Thus, MILS-12 is of relevance for structural and systems biology, inorganic biological chemistry, genetics, medicine, diagnostics, as well as teaching, etc.

Metal Ions in Biological Systems, Volume 43 - Biogeochemical Cycles of Elements Astrid Sigel 2005-02-28
Metal Ions in Biological Systems is devoted to increasing our understanding of the relationship between the chemistry of metals and life processes. The volumes reflect the interdisciplinary nature of bioinorganic chemistry and coordinate the efforts of researchers in the fields of biochemistry, inorganic chemistry, coordination chemis

Essential Metals in Medicine: Therapeutic Use and Toxicity of Metal Ions in the Clinic Peggy L. Carver 2019-01-14 Volume 19, entitled Essential Metals in Medicine: Therapeutic Use and Toxicity of Metal Ions in the Clinic of the series Metal Ions in Life Sciences centers on the role of metal ions in clinical medicine.

Metal ions are tightly regulated in human health: while essential to life, they can be toxic as well. Following an introductory chapter briefly discussing several important metal-related drugs and diseases and a chapter about drug development, the focus is first on iron: its essentiality for pathogens and humans as well as its toxicity. Chelation therapy is addressed in the context of thalassemia, its relationship to neurodegenerative diseases and also the risks connected with iron administration are pointed out. A subject of intense debate is the essentiality of chromium and vanadium. For example, chromium(III) compounds are taken as a nutritional supplement by athletes and bodybuilders; in contrast, chromate, Cr(VI), is toxic and a carcinogen for humans. The beneficial and toxic effects of manganese, cobalt, and copper on humans are discussed. The need for antiparasitic agents is emphasized as well as the clinical aspects of metal-containing antidotes for cyanide poisoning. In addition to the essential and possibly essential ones, also other metal ions play important roles in human health, causing harm (like the metalloid arsenic, lead or cadmium) or being used in diagnosis or treatment of human diseases, like gadolinium, gallium, lithium, gold, silver or platinum. The impact of this vibrant research area on metals in the clinic is provided in 14 stimulating chapters, written by internationally recognized experts from the Americas, Europe and China, and is manifested by approximately 2000 references, and about 90 illustrations and tables. Essential Metals in Medicine: Therapeutic Use and Toxicity of Metal Ions in the Clinic is an essential resource for scientists working in the wide range from pharmacology, enzymology, material sciences, analytical, organic, and inorganic biochemistry all the way through to medicine ... not forgetting that it also provides excellent information for teaching.

Metallo-Drugs: Development and Action of Anticancer Agents Astrid Sigel 2018-02-05 Volume 18, entitled Metallo-Drugs: Development and Action of Anticancer Agents of the series Metal Ions in Life Sciences centers on biological, medicinal

inorganic chemistry. The serendipitous discovery of the antitumor activity of cis-diamminodichloroplatinum(II) (cisplatin) by Barnett Rosenberg in the 1960s is a landmark in metallodrug-based chemotherapy. The success of cisplatin in the clinic, followed by oxaliplatin and carboplatin, along with their drawbacks relating mainly to resistance development and severe toxicity, initiated research on polynuclear platinum complexes and on Pt(IV) complexes as prodrugs. Furthermore, the indicated shortcomings led to the exploration of other transition and main group metal ions, among them Ru(II/III), Au(I/III), Ti(IV), V(IV/V), and Ga(III) including also the essential metal ions Fe(II/III), Cu(I/II), and Zn(II). Ionic as well as covalent and non-covalent interactions between structurally very different complexes and biomolecules like nucleic acids, proteins, and carbohydrates are studied and discussed with regard to their possible anticancer actions. Hence, MILS-18 summarizes the research at the forefront of medicinal inorganic chemistry, including studies on the next-generation, tailor-made anticancer drugs. All this and more is treated in an authoritative and timely manner in the 17 stimulating chapters of this book, written by 39 internationally recognized experts from 10 nations (from the US via Europe to China and Australia). The impact of this vibrant research area is manifested by more than 2700 references, nearly 150 illustrations (more than half in color) and several comprehensive tables. *Metallo-Drugs: Development and Action of Anticancer Agents* is an essential resource for scientists working in the wide range from enzymology, material sciences, analytical, organic, and inorganic biochemistry all the way through to medicine including the clinic ... not forgetting that it also provides excellent information for teaching.

Metal Transporters Jose M. Arguello 2012-10-25 This volume of *Current Topics in Membranes* focuses on metal transmembrane transporters and pumps, a recently discovered family of membrane proteins with many important roles in the physiology of living organisms. The book summarizes the most recent

advances in the field of metal ion transport and provides a broad overview of the major classes of transporters involved in homeostasis of heavy metals. Various families of the transporters and metal specificities are discussed with the focus on the structural and mechanistic aspects of their function and regulation. The reader will access information obtained through a variety of approaches ranging from X-ray crystallography to cell biology and bioinformatics, which have been applied to transporters identified in diverse biological systems, such as pathogenic bacteria, plants, humans and others. Field is cutting-edge and a lot of the information is new to research community. Wide breadth of topic coverage. Contributors of high renown and expertise.

Self-Assembled Molecules - New Kind of Protein Ligands

Irena Roterman 2020-10-08 The subject of this book relates to protein ligands with particular structural and complexation properties. They are composed of self-assembled molecules, capable of penetrating as a unit into proteins outside the binding site. The ribbon-like supramolecular system only permits the penetration of self-assembled molecules into the protein-body and formation of stable complexes. Supramolecular Congo red and similar compounds fit these requirements. Destabilized protein fragments enable the penetration of such ligands, with susceptibility to supramolecular ligand binding often associated with protein function. As a result, complexation modifies their functional effects. The activity of enzymes is inhibited by arresting them in the complexed state, but "naturally irreversible" complexation as in the case of immune complexation, is enhanced instead. This property offers many attractive possibilities of using supramolecular ligands as described in this book. This work was published by Saint Philip Street Press pursuant to a Creative Commons license permitting commercial use. All rights not granted by the work's license are retained by the author or authors.

Metals Ions in Biological System Astrid Sigel 2002-03-06
Volume 39: Molybdenum and Tungsten: Their Roles in Biological Processes is devoted solely to the vital research area on molybdenum and tungsten and their role in biology. It offers a comprehensive and timely account of this fascinating topic by 40 distinguished international authorities. Topics include: transport, homeostasis, regulation and binding of molybdate and tungstate to proteins, crystallographic characterization, coordination of complexes, and biosynthesis.

Metal Ions in Biological Systems: Simple complexes Helmut Sigel 1973

Structural and Catalytic Roles of Metal Ions in RNA Astrid Sigel 2015-07-24 The discovery of ribozymes nearly 30 years ago triggered a huge interest in the chemistry and biology of RNAs. Much of the recently made progress focusing on metal ions is addressed in MILS 9. This book, written by 28 internationally recognized experts from 8 nations, provides a most up-to-date view and is thus of special relevance for colleagues teaching courses in biological inorganic chemistry and for researchers dealing, e.g., with nucleic acids, gene expression, and enzymology, but also for those in analytical and bioinorganic chemistry or biophysics. *Structural and Catalytic Roles of Metal Ions in RNA* describes in an authoritative and timely manner in 12 stimulating chapters, supported by nearly 1600 references, 13 tables, and 75 illustrations, mostly in color, metal ion-binding motifs, methods to detect and characterize metal ion-binding sites, and the role of metal ions in folding and catalysis. It deals with diffuse metal ion binding, RNA quadruplexes, the regulation of riboswitches, metal ions and ribozymes, including artificial ribozymes. The spliceosome, the ribosome, ribozymes involving redox cofactors as well as the binding of kinetically inert metal ions to RNA are also covered.

Metallothioneins and Related Chelators Astrid Sigel 2015-07-24 These sulfur-rich chelators, being important in metal

ion homeostasis, find increasing attention. MILS-5, written by 30 internationally recognized experts, focuses on this hot topic. The reader is supported by about 20 tables, more than 80 illustrations and nearly 2000 references. This book is an essential resource for scientists working in a wide range of disciplines from environmental toxicology and inorganic biochemistry all the way through to physiology and medicine.

Organometallics in Environment and Toxicology Astrid Sigel 2015-07-24 Volume 7, devoted to the vital and rapidly expanding research area around metal-carbon bonds (see also MILS-6), focuses on the environment. With more than 2500 references, 35 tables, and nearly 50 illustrations, many of these in color, it is an essential resource for scientists working in the wide range from organometallic chemistry, inorganic biochemistry, environmental toxicology all the way through to physiology and medicine. In 14 stimulating chapters, written by 29 internationally recognized experts, *Organometallics in Environment and Toxicology* highlights in an authoritative and timely manner environmental cycles of elements involving organometal(loid) compounds as well as the analytical determination of such species. This book examines methane formation involving the nickel coenzyme F430, as well as the organometal(loid) compounds formed by tin, lead, arsenic, antimony, bismuth, selenium, tellurium, and mercury. In addition, it deals with the environmental bioindication, biomonitoring, and bioremediation of organometal(loid)s, and it terminates with methylated metal(loid) species occurring in humans by evaluating assumed and proven health effects caused by these compounds.

The Metal-Driven Biogeochemistry of Gaseous Compounds in the Environment Peter M.H. Kroneck 2014-11-22 MILS-14 provides a most up-to-date view of the exciting biogeochemistry of gases in our environment as driven mostly by microorganisms. These employ a machinery of sophisticated metalloenzymes, where especially transition metals (such as Fe, Ni, Cu, Mo, W)

play a fundamental role, that is, in the activation, transformation and syntheses of gases like dihydrogen, methane, carbon monoxide, acetylene and those of the biological nitrogen and sulfur cycles. The Metal-Driven Biogeochemistry of Gaseous Compounds in the Environment is a vibrant research area based mainly on structural and microbial biology, inorganic biological chemistry and environmental biochemistry. All this is covered in an authoritative manner in 11 stimulating chapters, written by 26 internationally recognized experts and supported by nearly 1200 references, informative tables and about 100 illustrations (two thirds in color). MILS-14 also provides excellent information for teaching. Peter M. H. Kroneck is a bioinorganic chemist who is exploring the role of transition metals in biology, with a focus on functional and structural aspects of microbial iron, copper and molybdenum enzymes and their impact on the biogeochemical cycles of nitrogen and sulfur. Martha E. Sosa Torres is an inorganic chemist, with special interests in magnetic properties of newly synthesized transition metal complexes and their reactivity towards molecular oxygen, applying kinetic, electrochemical and spectroscopic techniques.

Transition Metals and Sulfur - A Strong Relationship for Life Martha Sosa Torres 2020-04-06 Metal-Sulfur clusters play an essential role in living organisms through the unique character of sulfur-metal bonding. The new volume in prestigious Metal Ions in Life Sciences explores different transition metal complexes with sulfur, their biosynthesis and biological functions in regulation of gene expression, catalysis of important metabolic reactions and protein structure arrangement.

Metal-Carbon Bonds in Enzymes and Cofactors Astrid Sigel 2015-07-24 The occurrence of a wide variety of metal-carbon bonds in living organisms, ranging from bacteria to humans, is only recently recognized. Of course, the historical examples are the B12 coenzymes containing cobalt-carbon bonds, but now such bonds are also known for nickel, iron, copper, and other

transition metal ions. There is no other comparable book; MILS-6, written by 17 experts, summarizes the most recent insights into this fascinating topic.

Cadmium: From Toxicity to Essentiality Astrid Sigel 2013-02-26 Volume 11 provides in an authoritative and timely manner in 16 stimulating chapters, written by 40 internationally recognized experts from 11 nations, and supported by more than 2600 references, 35 tables, and over 100 illustrations, many in color, a most up-to-date view on the role of cadmium for life, presently a vibrant research area. MILS-11 covers the bioinorganic chemistry of Cd(II), its biogeochemistry, anthropogenic release into the environment, and speciation in the atmosphere, waters, soils, and sediments. The analytical tools for Cd determination, its imaging in cells, and the use of ^{113}Cd NMR to probe Zn(II) and Ca(II) proteins are summarized, as are Cd(II) interactions with nucleotides, nucleic acids, amino acids, and proteins including metallothioneins. The phytoremediation by Cd(II)-accumulating plants, etc., the toxicology of Cd(II), its damage to mammalian organs, and its role as a carcinogen for humans, are highlighted.

Metal Ions in Bio-Imaging Techniques Astrid Sigel 2021-03-08 Volume 22, entitled Metal Ions in Bio-Imaging Techniques, of the series Metal Ions in Life Sciences deals with metal ions as tools in imaging. This dates back to the first half of the past century, when barium sulfate was orally given to patients undergoing X-ray examination. The use of contrast agents has since developed into a large interdisciplinary field encompassing not only medicine, but also chemistry, material sciences, physics, biology, engineering, and computer sciences. MILS-22 provides deep and current insights in 17 stimulating chapters on the new research frontiers of this fast growing field on bio-imaging ... and beyond. For example, adding bio-sensing yields theranostic agents, meaning diagnosis and therapy linked in the same molecule; ions of Gd, Mn, Fe, Co, Ir, $^{99\text{m}}\text{Tc}$, etc., are involved. Other important topics are, e.g., metal complexes in paramagnetic Chemical

Exchange Transfer (paraCEST), radiometals for Positron Emission Tomography (PET) imaging, or paramagnetic metal ion probes for ^{19}F magnetic resonance imaging. MILS-22 is written by 57 internationally recognized experts from 12 countries, that is, from the US via Europe to China. The impact of this vibrant research area is manifested by more than 2300 references and nearly 120 figures, mostly in color, and several informative tables. To conclude, *Metal Ions in Bio-Imaging Techniques* is an essential resource for scientists working in the wide range from material sciences, enzymology, analytic, organic, and inorganic biochemistry all the way through to medicine including the clinic ... not forgetting that also excellent information for teaching is provided.

Trace Metals and Infectious Diseases Joseph Lemire
2015-05-22 Experts explore the influence of trace metals on the pathogenesis of infectious diseases.

Intracellular Calcium Regulation H. Bader 1986
Interrelations between Essential Metal Ions and Human Diseases
Astrid Sigel 2014-01-27 MILS-13 provides an up-to-date review on the relationships between essential metals and human diseases, covering 13 metals and 3 metalloids: The bulk metals sodium, potassium, magnesium, and calcium, plus the trace elements manganese, iron, cobalt, copper, zinc, molybdenum, and selenium, all of which are essential for life. Also covered are chromium, vanadium, nickel, silicon, and arsenic, which have been proposed as being essential for humans in the 2nd half of the last century. However, if at all, they are needed only in ultra-trace amounts, and because of their prevalence in the environment, it has been difficult to prove whether or not they are required. In any case, all these elements are toxic in higher concentrations and therefore, transport and cellular concentrations of at least the essential ones, are tightly controlled; hence, their homeostasis and role for life, including deficiency or overload, and their links to illnesses, including

cancer and neurological disorders, are thoroughly discussed. Indeed, it is an old wisdom that metals are indispensable for life. Therefore, Volume 13 provides in an authoritative and timely manner in 16 stimulating chapters, written by 29 internationally recognized experts from 7 nations, and supported by more than 2750 references, and over 20 tables and 80 illustrations, many in color, a most up-to-date view on the vibrant research area of the Interrelations between Essential Metal Ions and Human Diseases.
Metal Ions in Biological Systems Helmut Sigel 1973
Metal Ions in Biological Systems: Mixed-ligand complexes Helmut Sigel 1973

Metal Ions in Biological Systems, Volume 43 - Biogeochemical Cycles of Elements Helmut Sigel 2005-02-28
Metal Ions in Biological Systems is devoted to increasing our understanding of the relationship between the chemistry of metals and life processes. The volumes reflect the interdisciplinary nature of bioinorganic chemistry and coordinate the efforts of researchers in the fields of biochemistry, inorganic chemistry, coordination chemis
The Alkali Metal Ions: Their Role for Life Astrid Sigel 2016-02-09
MILS-16 provides an up-to-date review of the impact of alkali metal ions on life. Their bioinorganic chemistry and analytical determination, the solid state structures of bio-ligand complexes and the properties of alkali metal ions in solution in the context of all kinds of biologically relevant ligands are covered, this includes proteins (enzymes) and nucleic acids (G-quadruplexes). Minerals containing sodium (Na^+) and potassium (K^+) are abundant in the Earth's crust, making Na^+ and K^+ easily available. In contrast, the alkali elements lithium (Li^+), rubidium, and cesium are rare and the radioactive francium occurs only in traces. Since the intra- and extracellular, as well as the compartmental concentrations of Na^+ and K^+ differ significantly, homeostasis and active transport of these ions are important; this involves transporters/carriers and pore-forming ion channel proteins.

Systems like Na⁺/K⁺-ATPases, H⁺/K⁺-ATPases or Na⁺/H⁺ antiporters are thoroughly discussed. The role of K⁺ in photosynthesis and the role of Na⁺ in charging the "battery of life" are pointed out. Also, the relationships between alkali metal ions and diseases (e.g., Parkinson or traumatic brain injury) are covered and the relevance of Li⁺ salts in medicine (pharmacology and mechanism) is reviewed. This and more is treated in an authoritative and timely manner in the 16 stimulating chapters of Volume 16, *The Alkali Metal Ions: Their Role for Life*, which are written by 44 internationally recognized experts from 12 nations. The impact of this vibrant research area is manifested in nearly 3000 references, over 30 tables and more than 150 illustrations (two thirds in color). MILS-16 also provides excellent information for teaching. Astrid Sigel, Helmut Sigel, and Roland K. O. Sigel have long-standing interests in Biological Inorganic Chemistry. Their research focuses on metal ion interactions with nucleotides and nucleic acids and on related topics. They edited previously 44 volumes in the series *Metal Ions in Biological Systems*.

Metal Ions in Biological Systems 1986

Sustaining Life on Planet Earth: Metalloenzymes Mastering Dioxygen and Other Chewy Gases Peter M. H Kroneck
2015-02-23 MILS-15 provides an up-to-date review of the metalloenzymes involved in the activation, production, and conversion of molecular oxygen as well as the functionalization of the chemically inert gases methane and ammonia. Found either in aerobes (humans, animals, plants, microorganisms) or in anaerobes (so-called "impossible bacteria") these enzymes employ preferentially iron and copper at their active sites, in order to conserve energy by redox-driven proton pumps, to convert methane to methanol, or ammonia to hydroxylamine or other compounds. When it comes to the light-driven production of molecular oxygen, the tetranuclear manganese cluster of photosystem II must be regarded as the key player. However, dioxygen can also be produced in the dark, by heme iron-

dependent dismutation of oxyanions. Metalloenzymes Mastering Dioxygen and Other Chewy Gases is a vibrant research area based mainly on structural and microbial biology, inorganic biological chemistry, and environmental biochemistry. All this is covered in an authoritative manner in 7 stimulating chapters, written by 21 internationally recognized experts, and supported by nearly 1100 references, informative tables, and over 140 illustrations (many in color). MILS-15 provides excellent information for teaching; it is also closely related to MILS-14, *The Metal-Driven Biogeochemistry of Gaseous Compounds in the Environment*. Peter M. H. Kroneck is a bioinorganic chemist who is exploring the role of transition metals in biology, with a focus on functional and structural aspects of microbial iron, copper, and molybdenum enzymes and their impact on the biogeochemical cycles of nitrogen and sulfur. Martha E. Sosa Torres is an inorganic chemist, with special interests in magnetic properties of newly synthesized transition metal complexes and their reactivity towards molecular oxygen, applying kinetic, electrochemical, and spectroscopic techniques.

Metal Ions in Biological Systems: Circulation of metals in the environment Helmut Sigel 1973

The Role of Metal Ions in Biology, Biochemistry and Medicine

Michael Moustakas 2021-09-06 Metal ions are fundamental elements for the maintenance of the lifespan of plants, animals and humans. Their substantial role in biological systems was recognized a long time ago. They are essential for the maintenance of life and their absence can cause growth disorders, severe malfunction, carcinogenesis or death. They are protagonists as macro- or microelements in several structural and functional roles, participating in many bio-chemical reactions, and arise in several forms. They participate in intra- and intercellular communications, in maintaining electrical charges and osmotic pressure, in photosynthesis and electron transfer processes, in the maintenance of pairing, stacking and the

stability of nucleotide bases and also in the regulation of DNA transcription. They contribute to the proper functioning of nerve cells, muscle cells, the brain and the heart, the transport of oxygen and to many other biological processes up to the point that we cannot even imagine a life without metals. In this book, the papers published in the Special Issue "The Role of Metal Ions in Biology, Biochemistry and Medicine" are summarized, providing a picture of metal ion uses in biology, biochemistry and medicine, but also pointing out the toxicity impacts on plants, animals, humans and the environment.

Metal Ions in Biological Systems: Metal. Metal ions as probes Helmut Sigel 1974-09

Metal Ions in Biological Systems Helmut Sigel 2000-01-27
"Highlights the availability of magnesium to organisms, its uptake and transport in microorganisms and plants as well as its role in health and disease of animals and humans including its toxicology."

Metals, Microbes, and Minerals - The Biogeochemical Side of Life
Peter Kroneck 2021-01-18 One of the biggest questions in today's biochemistry is how biological molecules became essential for the processes that occur within living cells. This new book from outstanding Metal Ions in Life Science series gives an overview about biochemical evolution of organic molecules and metabolic pathways in living systems and outlines the vital biochemical processes in microbial cells in which metals are involved.

Advanced Magnetic Resonance Techniques in Systems of High Molecular Complexity NICCOLAI 2012-12-06 The second volume of the series on inorganic biochemistry and bio physics is singularly devoted to magnetic resonance on systems of high molecular complexity. Recently, there have been important advances in magnetic resonance studies of polymers; these advances touch on all aspects of magnetic resonance, both theoretical and applied. Particular emphasis is placed here on multipulse experiments. We believe such an report will be of

considerable interest to the readers of our series owing to the importance of magnetic resonance techniques in the investigation of biopolymers. Ivano Bertini Harry Gray Series Editors Preface This book is a record of the Proceedings of the International Symposium on "Advanced Magnetic Resonance Techniques in Systems of High Molecular Complexity", which was held in Siena between 15 and 18 May 1985. The idea of the meeting is due to Proff. N.M. Atherton, G. Giacometti and E. Tiezzi with the aim of honouring the scientific personality of Prof. S.I. Weissman. The meeting has been organized with the assistance of a National Committee formed by R. Basosi, I. Bertini, P. Bucci, C. Corvaia, A. Gamba, G. Martini, G.F. Pedulli, P.A. Temussi, and C.A. Veracini. The invited lecturers responded enthusiastically and a comprehensive picture of the theoretical and practical aspects of magnetic resonance could be therefore provided. The book contains all the plenary lectures delivered during the meeting and also a wide selection among the huge amount of contributions collected by the organizers.

Lead: Its Effects on Environment and Health Astrid Sigel 2017-04-10 Volume 17, entitled Lead: Its Effects on Environment and Health of the series Metal Ions in Life Sciences centers on the interrelations between biosystems and lead. The book provides an up-to-date review of the bioinorganic chemistry of this metal and its ions; it covers the biogeochemistry of lead, its use (not only as gasoline additive) and anthropogenic release into the environment, its cycling and speciation in the atmosphere, in waters, soils, and sediments, and also in mammalian organs. The analytical tools to determine and to quantify this toxic element in blood, saliva, urine, hair, etc. are described. The properties of lead(II) complexes formed with amino acids, peptides, proteins (including metallothioneins), nucleobases, nucleotides, nucleic acids, and other ligands of biological relevance are summarized for the solid state and for aqueous solutions as well. All this is important for obtaining a coherent picture on the properties of

lead, its effects on plants and toxic actions on mammalian organs. This and more is treated in an authoritative and timely manner in the 16 stimulating chapters of Volume 17, which are written by 36 internationally recognized experts from 13 nations. The impact of this recently again vibrant research area is manifested in nearly 2000 references, over 50 tables and more than 100 illustrations (half in color). Lead: Its Effects on Environment and Health is an essential resource for scientists working in the wide range from material sciences, inorganic biochemistry all the way through to medicine including the clinic ... not forgetting that it also provides excellent information for teaching.

Neurodegenerative Diseases and Metal Ions Astrid Sigel
2006-07-11 About the Series... Metal Ions in Life Sciences links coordination chemistry and biochemistry in their widest sense and thus increases our understanding of the relationship between the chemistry of metals and life processes. The series reflects the interdisciplinary nature of Biological Inorganic Chemistry and coordinates the efforts of scientists in fields like biochemistry, inorganic chemistry, coordination chemistry, molecular and structural biology, enzymology, environmental chemistry, physiology, toxicology, biophysics, pharmacy, and medicine. Consequently, the volumes are an essential source for researchers active in these and related fields as well as teachers preparing courses, e.g., in Bioinorganic Chemistry. About this Book... Volume 1, devoted solely to the vital research area concerning the role of metal ions in neurodegenerative diseases, offers in 15 stimulating chapters an authoritative and timely view of this fascinating subject. Written by 41 internationally recognized experts, Neurodegenerative Diseases and Metal Ions highlights, supported by 130 illustrations, the recent progress made in understanding the role metal ions play in diseases like transmissible spongiform encephalopathies (Creutzfeldt-Jakob and related diseases), Alzheimer's, Parkinson's, Huntington's, Wilson's and Menkes' diseases, as well as in familial amyotrophic

lateral sclerosis and others. The interplay between metal ions, catecholamines and the formation of reactive oxygen species resulting in oxidative stress is considered, as is the metalloneurochemistry of zinc and the neurotoxicity of aluminum, cadmium, lead, and mercury. The need for novel drugs which manipulate metal-centered neuropathology is emphasized.

Transition Metals in Biochemistry Arthur Brill 2011-12-27
Transition metal ions in biological systems are of interest in biology, biochemistry, chemistry, medicine, and physics. Scientists with rather different viewpoints, employing many methods, have contributed to this area. A concise review of the current state of the field will, to some extent, reflect the special knowledge of the person writing it - in this case application of physical methods to the investigation of metal coordination. X-ray diffraction is one of the most important of these methods, but a useful treatment of X-ray structure analysis would be comparable in size with and beyond the scope of the monograph. Many results of X-ray diffraction studies are, of course, presented. Electron paramagnetic resonance spectroscopy has played a major part in the rapid advance in knowledge of the electronic structures of transition metal ions in biological systems. More generally, measurements involving light, microwaves, and magnetic fields are capable of producing much new information, and the required instrumentation is available at most research institutions. Therefore light absorption and paramagnetic resonance are treated in depth. The principles described in the latter discussions are broadly applicable, for example to the promising techniques of X-ray spectroscopy (utilizing synchrotron radiation) and lanthanide-perturbed, very high-resolution nuclear magnetic resonance spectroscopy.

Metal Ions in Biological Systems Taylor & Francis Group
2020-09-30 This volume first considers the categories of zinc metalloenzymes, together with models of the enzymic metal-ion binding sites. It covers the nutritional aspects of zinc: its

absorption and excretion, its influence on the activity of enzymes and hormones, and the zinc deficiency syndrome.

Practical Approaches to Biological Inorganic Chemistry

Robert R. Crichton 2012-12-31 The book reviews the use of spectroscopic and related methods to investigate the complex structures and mechanisms of biological inorganic systems that contain metals. Each chapter presents an overview of the technique including relevant theory, clearly explains what it is and how it works and then presents how the technique is actually used to evaluate biological structures. Practical examples and problems are included to illustrate each technique and to aid understanding. Designed for students and researchers who want to learn both the basics, and more advanced aspects of bioinorganic chemistry. Many colour illustrations enable easier visualization of molecular mechanisms and structures Worked examples and problems are included to illustrate and test the reader's understanding of each technique Written by a multi-author team who use and teach the most important techniques used today to analyse complex biological structures

Metal Ions in Toxicology Astrid Sigel 2011 It is an old wisdom that metals are indispensable for life. Indeed, several of them, like sodium, potassium, and calcium, are easily discovered in

living matter. However, the role of metals and their impact on life remained largely hidden until inorganic chemistry and coordination chemistry experienced a pronounced revival in the 1950s. The experimental and theoretical tools created in this period and their application to biochemical problems led to the development of the field or discipline now known as Bioinorganic Chemistry, Inorganic Biochemistry, or more recently also often addressed as Biological Inorganic Chemistry. By 1970 Bioinorganic Chemistry was established and further promoted by the book series Metal Ions in Biological Systems founded in 1973 (edited by H. S., who was soon joined by A.S.) and published by Marcel Dekker, Inc., New York, for more than 30 years. After this company ceased to be a family endeavor and its acquisition by another company, we decided, after having edited 44 volumes of the MIBS series (the last two together with R.K.O.S.) to launch a new and broader minded series to cover today's needs in the Life Sciences. Therefore, the Sigel's new series is entitled Metal Ions in Life Sciences. After publication of the first four volumes (2006-2008) with John Wiley & Sons, Ltd., Chichester, UK, we are happy to join forces now in this still new endeavor with the Royal Society of Chemistry, Cambridge, UK; a most experienced Publisher in the Sciences.