Metal Ions In Biological Systems Vol 31 Vanadium And Its Role For Life

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Metal Ions in Biological Systems Astrid Sigel 1995-02-22 "Volume 31, devoted solely to the role of vanadium in life processes, offers a comprehensive and timely account of this fascinating field by

37 distinguished, international authorities. Highlights the properties of the various oxidation states of vanadium, their affinity for biogenic ligands, the effects of vanadium species on enzyme activity, the role of vanadium in nitrogenases and haloperoxidases, and more."

Gold and its Complexes in Anticancer Chemotherapy Mohmmad Younus Wani 2021-02-11 This book presents an overview of cancer and the genesis, and development of different treatment strategies and modalities against cancer. The emergence of gold and its complexes as promising anticancer chemotherapeutic agents have the potential to substitute or replace the platinum based chemotherapeutic agents. Gold complexes have demonstrated considerable anti-proliferative properties, chiefly attributed to their anti-mitochondrial effects, they make gold complexes excellent candidates as anti-cancer agents compared to their platinum-based counterparts. This book provides a critical review of recent advances made in the development of gold complexes as anti-cancer agents. In this context, it examines a number of different ligand architectures, provides comprehensive information on gold complexes' mechanism of action and toxicity issues and, in closing, outlines future research directions.

Present Knowledge in Nutrition John W. Erdman, Jr. 2012-05-30 Present Knowledge in Nutrition, 10th Edition provides comprehensive coverage of all aspects of human nutrition, including micronutrients, systems biology, immunity, public health, international nutrition, and diet and disease prevention. This definitive reference captures the current state of this vital and dynamic science from an international perspective, featuring nearly 140 expert authors from 14 countries around the

world. Now condensed to a single volume, this 10th edition contains new chapters on topics such as epigenetics, metabolomics, and sports nutrition.The remaining chapters have been thoroughly updated to reflect recent developments. Suggested reading lists are now provided for readers wishing to delve further into specific subject areas. An accompanying website provides book owners with access to an image bank of tables and figures as well as any updates the authors may post to their chapters between editions. Now available in both print and electronic formats, the 10th edition will serve as a valuable reference for researchers, health professionals, and policy experts as well as educators and advanced nutrition students.

The Cambridge World History of Food Kenneth F. Kiple 2000 A two-volume set which traces the history of food and nutrition from the beginning of human life on earth through the present.

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.

Sports Nutrition Ira Wolinsky 2005-10-31 In competitive sports where an extra breath or a millisecond quicker neural response can spell the difference between fame and mediocrity, a number of myths have persisted around the impact of what might be considered megadoses of various vitamins and trace elements. We do know that a growing body of research indicates that work capacity, oxygen co

Encyclopedia of Human Nutrition Lindsay Allen 2005-07-20 Encyclopedia of Human Nutrition, Second Edition is a thorough revision and 20% expansion of the 1998 release, reflecting the continuing scientific advances in the field of human nutrition. Now a four-volume set, nearly 300 articles with concise, up-to-date information are complemented by an award-winning indexing system. Included is

expanded coverage of epidemiology of diet-related diseases, functional foods, food safety, clinical nutrition and gastrointestinal disorders. Virtually everyone will find the Encyclopedia of Human Nutrition an easy-to-use resource making it an ideal reference choice for both the professional and the non-professional alike. Also available online via ScienceDirect – featuring extensive browsing, searching, and internal cross-referencing between articles in the work, plus dynamic linking to journal articles and abstract databases, making navigation flexible and easy. For more information, pricing options and availability visit www.info.sciencedirect.com. FEATURES OF SECOND PRINT EDITION Now a four-volume set with over 250 articles Expanded coverage of epidemiology of diet-related diseases, functional foods, food safety, and gastrointestinal disorders, among other topics ONLINE FEATURES AND FUNCTIONALITIES Browse the whole work by volume, authors or article titles Full and extensive subject index can be searched or browsed online, and takes you directly to the indexed paragraph, section, figure or table Basic and advanced search functionality across the entire work or by specific volume Users can build, save and re-run seraches, as well as combine saved searches Extensive internal cross-referencing and dynamic linking from biliographic references to primary-source material, increasing the scope of your research rapidly and effectively All articles available as full-text HTML files, or as PDF files that can be viewed, downloaded or printed in their original format

Metal Ions in Biological Systems Helmut Sigel 2003-03-27 The Metal Ions in Biological Systems series 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 chemistry

Handbook on Metalloproteins Ivano Bertini 2001-06-29 This Handbook on Metalloproteins focuses on the available structural information of proteins and their metal ion coordination spheres. It centers on the metal ions indispensable for life but also considers metal ions used as substitution probes in studies of metalloproteins. Emphasizing the structure-function relationship, the book covers the common and distinct characterstics of metallo- enzymes, proteins, and amino acids bonded to copper, zinc, iron, and more.

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.

Biomedical EPR - Part B: Methodology, Instrumentation, and Dynamics Sandra S. Eaton 2004 Biomedical EPR – Part A focuses on applications of EPR

spectroscopy in the areas of free radicals, metals, medicine, and physiology. The book celebrates the 70th birthday of Prof. James S. Hyde, Medical College of Wisconsin, and his contributions to this field. Chapters are written to provide introductory material for new-comers to the field which lead into up-to-date reviews that provide perspective on the wide range of questions that can be addressed by EPR. Key Features:Free Radicals in Medicine Radicals in vivo and in Model Systems, and their Study by Spin Trapping In vivo EPR, including Oximetry and Imaging Time Domain EPR at Radio Frequencies EPR of Copper Complexes: Motion and Frequency Dependence Time Domain EPR and Electron Spin Echo Envelope Modulation About the Editors: Prof. Sandra S. Eaton is John Evans Professor in the Department of Chemistry and Biochemistry at the University of Denver. Her research interests include distance measurements in proteins, EPR of metal ions in biological systems, electron spin relaxation times, and EPR instrumentation. The Eatons co-organize an annual EPR Symposium in Denver. Prof. Gareth R. Eaton is John Evans Professor in the Department of Chemistry and Biochemistry at the University of Denver. His research interests include EPR instrumentation, distance measurements in proteins, EPR of metal ions in biological systems, and electron spin relaxation times. Dr. Lawrence J. Berliner is currently Professor and Chair of the Department of Chemistry and Biochemistry at the University of Denver after retiring from Ohio State University, where he spent a 32-year career in the area of biological magnetic resonance (EPR and NMR). He is the Series Editor for Biological Magnetic Resonance, which he launched in 1979.

Metals Ions in Biological System Astrid

Sigel 2002-03-06 Volume 39: Molybdenum and Tungsten: Their Roles in Biological Processes is devoted soley 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.

Nutritional Aspects and Clinical Management of Chronic Disorders and Diseases Felix Bronner 2002-07-29 Premature births, musculoskeletal diseases, diabetes mellitus, and psychiatric disorders. Nutrition plays a direct or indirect role in the causes, treatment, and/or management of many chronic disorders and diseases, yet nutritional and dietary intervention is often left solely to paramedical staff. This book shows why nutritional and dietary interv

Managing Global Resources and Universal Processes Brian D. Fath 2020-07-29 Bringing together a wealth of knowledge, Environmental Management Handbook, Second Edition, gives a comprehensive overview of environmental problems, their sources, their assessment, and their solutions. Through in-depth entries and a topical table of contents, readers will quickly find answers to questions about environmental problems and their corresponding management issues. This six-volume set is a reimagining of the award-winning Encyclopedia of Environmental Management, published in 2013, and features insights from more than 500 contributors, all experts in their field. The experience, evidence, methods, and models used in studying environmental management are presented here in six

stand-alone volumes, arranged along the major environmental systems. Features The first handbook that demonstrates the key processes and provisions for enhancing environmental management Addresses new and cutting-edge topics on ecosystem services, resilience, sustainability, food–energy–water nexus, socio-ecological systems, and more Provides an excellent basic knowledge on environmental systems, explains how these systems function, and offers strategies on how to best manage them Includes the most important problems and solutions facing environmental management today In this first volume, Managing Global Resources and Universal Processes, the reader is introduced to the general concepts and processes used in environmental management. As an excellent resource for finding basic knowledge on environmental systems, it reflects an extensive coverage of the field and includes the most important problems and solutions facing environmental management today. This book practically demonstrates the key processes, methods, and models used in studying environmental management.

Pulmonary Immunotoxicology Mitchell D. Cohen 2012-12-06 Pulmonary Immunotoxicology is a comprehensive exploration of the effects of various inhaled materials upon the immune system of the respiratory tract. It will be useful to investigators in the field of pulmonary toxicology and immunotoxicology, and to those involved in administration and regulation of matters related to inhaled materials. It can also serve as a textbook for a course in pulmonary immunotoxicology at graduate or advanced undergraduate level. Pulmonary Immunotoxicology comprises four sections. The first provides basic background

concepts essential for understanding pulmonary immunotoxicology, including discussions of the normal structure and function of the respiratory system, its basic immunology, and the manner by which inhaled particles and gases are removed from the air and deposited upon respiratory tract surfaces. The second section provides an overview of the major types of pathological consequences which can arise from immunomodulation within the respiratory tract, including hypersensitivity and asthma, inflammation and fibrosis, as well as immunosuppression and autoimmunity. The third section, which comprises the largest portion of the book, deals specifically with major classes of airborne agents that are known to alter the immune function of the respiratory tract. These are arranged into major classes: organic agents, metals, gases, particles, biologics, and complex mixtures. The fourth and final section of the book explores the area of risk assessment, including discussions of the basic concepts of risk assessment as they apply specifically to immunotoxicologic effects upon the lungs, and the use of biomarkers as indices of potential pulmonary immunotoxic responses to inhaled materials.

Trace Elements in Laboratory Rodents Ronald R. Watson 2020-10-28 Written by the international community's leading experts, Trace Elements in Laboratory Rodents describes the best and most current methods to provide deficient or supplemental trace elements to laboratory animals, as well as how to assay them. The experts warn of the common pitfalls and hidden problems in nutritional testing and how to avoid them. This how-to approach focuses on the technical details that make good, reliable studies. Common as well as rare or recently recognized minerals are

described relating to both dietary supplementation and measurement in tissues. If you are a researcher, professor, or student working in nutrition, food science, biochemistry, or veterinary medicine, you can't afford to be without this excellent hands-on methods manual!

Immunotoxicology Of Environmental And Occupational Metals Judith T Zelicoff 1998-02-20 Provides an overview of the effects of environmentally and occupationally important metals on the immune system and host defence. The fist ten chapters in the text focus on particular metals or groups of metals, including arsenic, beryllium, cadmium, chromium, lead, mercury, nickel and vanadium. Subsequent chapters examine the immunotoxicological effects of trace metals such as indium and platinum and essential metals such as iron, zinc and copper. The main emphasis is on the in vivo and in vitro effects of these metals on host immune responses in a variety of mammalian species including humans. Each chapter also briefly reviews the history, use, occurrence, biology and toxicology of the metals.

Clinical Nutrition of the Essential Trace Elements and Minerals John D. Bogden 2000-07-26 The Nutrition and Health series of books have, as an overriding mission, to provide health professionals with texts that are considered essential because each includes 1) a synthesis of the state of the science, 2) timely, in-depth reviews by the leading researchers in their respective fields, 3) extensive, up-to-date fully annotated reference lists, 4) a detailed index, 5) relevant tables and figures, 6) identification of paradigm shifts and the consequences, 7) virtually no overlap of information between chapters, but targeted, inter-chapter referrals, 8)

suggestions of areas for future research, and 9) bal anced, data-driven answers to patient questions which are based upon the totality of evidence rather than the findings of any single study. The series volumes are not the outcome of a symposium. Rather, each editor has the potential to examine a chosen area with a broad perspective, both in subject matter as well as in the choice of chapter authors. The international perspective, especially with regard to public health initiatives, is emphasized where appropriate. The editors, whose trainings are both research and practice oriented, have the opportunity to develop a primary objec tive for their book; define the scope and focus, and then invite the leading authorities from around the world to be part of their initiative. The authors are encouraged to provide an overview of the field, discuss their own research and relate the research findings to potential human health consequences.

Metal Ions in Biology and Medicine Lylia Khassanova 1990-05 Proceedings of the Seventh International Symposium on Metal Ions in Biology & Medicine held in Saint Petersburg State University, Saint Petersburg, Russia, on 5-9 May 2002.

Experimental Models of Diabetes John H. McNeill 2018-05-11 An extremely useful text for research Internationally renowned experts describe the models, provide data obtained with those models, and discuss the relative usefulness of models in relation to the diabetic syndrome in humans. The first section examines the most widely used model, the streptozotocin (STZ) rat, condensing a massive quantity of literature to present both the general effects of of STZ diabetes and the effects on individual organ systems. The second section discusses less well-known and more recent diabetic models, such as the BB rat, the

NOD mouse and Zucker and Zucker Diabetic Fatty rat models. Genetic models of insulin dependent diabetes mellitus (IDDM) are examined and compared to chemically induced IDDM models.

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.

Vanadium Compounds: Biochemical and Therapeutic Applications Ashok K. Srivastava 2012-12-06 The papers in this volume comprise invited reviews as well as original research papers presented at the Vanadium Symposium held July 29-31, 1994. Vanadium is a trace element and its compounds have been shown to exert a wide variety of insulin-like effects including the ability to lower hyperglycemia in several experimental models of diabetes mellitus. Because of the possibility that vanadium compounds may be able to serve as potential therapeutic agents for the treatment of diabetes, and possibly other diseases, this trace element has attracted the attention of biomedical researchers from a variety of fields. The Vanadium Symposium 1994 was therefore organized to facilitate exchange of ideas and increase interaction among researchers of different disciplines actively engaged in studying the biological actions of vanadium compounds. The papers are written by leading vanadium researchers and are grouped into three main sections: the chemistry, biochemical and physiological aspects, and potential therapeutic use and toxic effects of vanadium compounds. A good source of information on vanadium chemistry and

biology.

Food Toxicology Debasis Bagchi 2016-11-25 Food toxicology studies how natural or synthetic poisons and toxicants in diverse food products cause harmful, detrimental, or adverse side effects in living organisms. Food toxicology is an important consideration as food supply chain is becoming more multinational in origin, and any contamination or toxic manifestation may cause serious, wide-spread adverse health effects. Food Toxicology covers various aspects of food safety and toxicology, including the study of the nature, properties, effects, and detection of toxic substances in food and their disease manifestations in humans. It will also include other aspects of consumer product safety. The first two chapters discuss the measurement of toxicants and toxicity and the importance of dose-response in food toxicology. Additional chapters discuss the aspects of food associated carcinogenesis and food-derived chemical carcinogenesis, food allergy, pathogens associated with fruits and vegetables, and the detrimental effects of radionuclides exposure. The chapters also cover the most important heavy metal contaminants, namely mercury, lead and vanadium, and Fluoride toxicity, which is extensively discussed in its own chapter. Toxicologists, scientists, researchers in food toxicology, nutritionists, and public health care professionals will find valuable information in this book on all possible intricate areas of food toxicology.

Environmental Management Handbook, Second Edition – Six Volume Set Sven Erik Jorgensen 2022-07-30 Bringing together a wealth of knowledge, the Handbook of Environmental Management, Second Edition, gives a comprehensive overview of environmental problems, their sources, their assessment, and their solutions.

Through in-depth entries, and a topical table of contents, readers will quickly find answers to questions about pollution and management issues. This six-volume set is a reimagining of the award-winning Encyclopedia of Environmental Management, published in 2013, and features insights from more than 500 contributors, all experts in their fields. The experience, evidence, methods, and models used in studying environmental management is presented here in six stand-alone volumes, arranged along the major environmental systems. Features of the new edition: The first handbook that demonstrates the key processes and provisions for enhancing environmental management. Addresses new and cutting - edge topics on ecosystem services, resilience, sustainability, food-energy-water nexus, socio-ecological systems and more. Provides an excellent basic knowledge on environmental systems, explains how these systems function and offers strategies on how to best manage them. Includes the most important problems and solutions facing environmental management today.

Handbook of Elemental Speciation II Joseph A. Caruso 2005-06-17 Written by an internationally recognized group of editors and contributors, Handbook of Elemental Speciation, Volume 2 provides a comprehensive, cross-disciplinary presentation of the analytical techniques involved in speciation. Comprehensive coverage of key elements and compounds in situ Addresses the analysis and impact of these elements and compounds, e.g. arsenic, lead, copper, iron, halogens, etc., in food, the environment, clinical and occupational health Detailed methodology and data are reported, as well as regulatory limits Includes general introduction on the impact in these key areas

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 113Cd 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.

Bioinorganic Vanadium Chemistry Dieter Rehder 2008-04-15 Vanadium is named after Vanadis, the most aristocratic of Norse goddesses, who symbolises beauty and fertility - essential features of vanadium chemistry. It is a ubiquitous trace element, with a surprising range of biological functions. In Bioinorganic Vanadium Chemistry, Dieter Rehder addresses the major aspects of vanadium chemistry related to living organisms and the mutual impact between biological and inorganic vanadium chemistry. Topics covered include: the history, natural occurrence, distribution and impact of vanadium inorganic aspects of the function of vanadium in biological systems interaction of aqueous vanadate and vanadyl with biogenic ligands vanadium coordination

compounds the vanadium-carbon bond methods of characterisation of biogenic and model vanadium systems (EPR and ENDOR for oxovanadium(IV); 51V NMR for vanadium(V); XAS) vanadium in ascidians and polychaeta worms the concentration of vanadium in the form of amavadin by Amanita mushrooms vanadate-dependent haloperoxidases vanadium and the nitrogen cycle vanadate as energiser for bacteria, and vanadophores medicinal aspectsm including the anti-diabetic potential of vanadium compounds interaction of vanadium with proteins and protein substrates vanadium and phosphate-metabolising enzymes Bioinorganic Vanadium Chemistry conveys the essential aspects of vanadium bioinorganic chemistry, making this book a valuable complement to more general bioinorganic chemistry texts and more specialized topical reviews for researchers and students alike.

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.

Enzyme Kinetics: Catalysis and Control Daniel L. Purich 2010-06-16 Far more than a comprehensive treatise on initial-rate and fast-reaction kinetics, this one-of-a-kind desk reference places enzyme science in the fuller context of the organic, inorganic, and physical chemical processes occurring within enzyme active sites. Drawing on 2600 references, Enzyme Kinetics: Catalysis & Control develops all the kinetic tools needed to define enzyme catalysis, spanning the entire spectrum (from the basics of chemical kinetics and practical

advice on rate measurement, to the very latest work on single-molecule kinetics and mechanoenzyme force generation), while also focusing on the persuasive power of kinetic isotope effects, the design of high-potency drugs, and the behavior of regulatory enzymes. Historical analysis of kinetic principles including advanced enzyme science Provides both theoretical and practical measurements tools Coverage of single molecular kinetics Examination of force generation mechanisms Discussion of organic and inorganic enzyme reactions

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 fi rst 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 benefi cial 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.

Membrane Structure in Disease and Drug Therapy Svante Cornell 2000-05-10 This study asserts that cellular and intracellular membranes are active in every aspect of the body's physiology and pathophysiology. It compares secondary through to quaternary structures and protien sequences and guages their influence on health, disease and drug therapy. The book highlights the importance of correlations, homologies and categorizing multifunctionality by domain and complex.

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

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.

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

Encyclopedia of Human Nutrition 2012-12-28 The role of nutrition in improving quality of life and combating disease is undeniable — and researchers from different disciplines are bringing their perspectives to bear on this fundamental topic. The 4-volume Encyclopedia of Human Nutrition, Third Edition, is a thorough revision of the previous award-winning version and reflects the scientific advances in the field of human nutrition. It presents the latest understanding on a wide range of nutrition-related topics including food safety, weight management, vitamins, bioengineering of foods, plant based diet and raw foods among others. New articles on organic food, biofortification, nutritional labeling and the effect of religious customs on diet, among many others, reflect the dedication to currency in this revision. It not only contains the most current and thorough information available on the topic, but also contains broader cross-referencing on emerging opportunities for potential treatment and prevention of diseases. An ideal starting point for scientific research, Encyclopedia of Human Nutrition, Third Edition, continues to provide authoritative information in an accessible format, making this complex discipline available to readers at both the professional and non-professional level. Selected for inclusion in

Doody's Core Titles 2013, an essential collection development tool for health sciences libraries Approximately 30% new content ensures readers have the latest research information Extensive cross-referencing provides key connections between topics in this multidisciplinary field Presents current information on relationships between disease and nutrition Covers thoroughly topics ranging from nutrient biochemistry and function to clinical nutrition and the epidemiology of diet, health and disease.

Binding, Transport and Storage of Metal Ions in Biological Cells Wolfgang Maret 2014-07-30 Metal ions play key roles in biology. Many are essential for catalysis, for electron transfer and for the fixation, sensing, and metabolism of gases. Others compete with those essential metal ions or have toxic or pharmacological effects. This book is structured around the periodic table and focuses on the control of metal ions in cells. It addresses the molecular aspects of binding, transport and storage that ensure balanced levels of the essential elements. Organisms have also developed mechanisms to deal with the non-essential metal ions. However, through new uses and manufacturing processes, organisms are increasingly exposed to changing levels of both essential and non-essential ions in new chemical forms. They may not have developed defenses against some of these forms (such as nanoparticles). Many diseases such as cancer, diabetes and neurodegeneration are associated with metal ion imbalance. There may be a deficiency of the essential metals, overload of either essential or non-essential metals or perturbation of the overall natural balance. This book is the first to comprehensively survey the molecular nature of the overall natural balance of

metal ions in nutrition, toxicology and pharmacology. It is written as an introduction to research for students and researchers in academia and industry and begins with a chapter by Professor R J P Williams FRS.

Metal Ions in Biological Systems Sanat Dhar 2013-03-09 The articles published in this volume are based on the papers del ivered at a conference on the Role of Metal Ions in Biological Systems held November 20 and 21, 1972, at Argonne National Laboratory. The purpose of the conference was to present to an interdiscipl inary audience of physical scientists some recent developments illustrating the chemical and environ mental participation of the heavy metal ions in the biological system. The invited speakers at the conference are special ists in the fields they describe, and the articles presented here are at a level of interest to readers with backgrounds in physical sciences who are not necessari Iy doing research in the areas described. The articles are referenced through 1972, and in some cases early 1973, and thus should also be of value to research workers. It is hoped that the book wi II be of particular interest to chemists, biologists, workers in the fields of en vironmental science and publ ic health, as wei I as graduate and senior undergraduate students in these discipl ines. The conference was sponsored by the Central States Universities, Inc. , a consortium of sixteen midwestern univer sities, the Center for Educational Affairs, Argonne National Laboratory, and the United States Atomic Energy Commission. It is my pleasure to thank the members of the conference committee for their ideas and active help in organizing the conference.

The Chemistry of Evolution R.J.P Williams 2005-12-17 Conventionally,

evolution has always been described in terms of species. The Chemistry of Evolution takes a novel, not to say revolutionary, approach and examines the evolution of chemicals and the use and degradation of energy, coupled to the environment, as the drive behind it. The authors address the major changes of life from bacteria to man in a systematic and unavoidable sequence, reclassifying organisms as chemotypes. Written by the authors of the bestseller The Biological Chemistry of the Elements - The Inorganic Chemistry of Life, the clarity and precision of The Chemistry of Evolution plainly demonstrate that life is totally interactive with the environment. This exciting theory makes this work an essential addition to the academic and public library. * Provides a novel analysis of evolution in chemical terms * Stresses Systems Biology * Examines the connection between life and the environment, starting with the 'big bang' theory * Reorientates the chemistry of life by emphasising the need to analyse the functions of 20 chemical elements in all organisms

Draft Toxicological Profile for Vanadium 2009

Metals in Biology Graeme Hanson 2010-03-11 Metal ions in biology is an ever expanding area in science and medicine involving metal ions in proteins and enzymes, their biosynthesis, catalysis, electron transfer, metal ion trafficking, gene regulation and disease. While X-ray crystallography has provided snapshots of the geometric structures of the active site redox cofactors in these proteins, the application of high resolution EPR spectroscopy in conjunction with quantum chemistry calculations has enabled, in many cases, a detailed understanding of a metalloenzymes mechanism through

investigations of the geometric and electronic structure of the resting, enzyme-substrate intermediates and product complexes. This volume, Part II of a two-volume set demonstrates the application of high resolution EPR spectroscopy in determining the geometric and electronic structure of active site metal ion centers in iron sulfur cluster containing metalloproteins, mononuclear molybdenum metalloenzymes, manganese-containing enzymes and novel metalloproteins.