

Mammalian Cell Culture Zip

Chapters in this book review the remarkable advances in the field of zinc biology over the last decade. Zinc is essential for life, in particular for growth and development, through its role in hundreds of zinc enzymes and thousands of zinc proteins. Its catalytic, structural, and regulatory functions in these proteins impact metabolism, gene expression, and signal transduction, including neurotransmission. Among the micronutrients, zinc may rank with iron as to its importance for public health. The topics covered range from single molecules to cells and to whole organisms: the chemistry, design, and application of fluorophores for the determination of cellular zinc; the role of zinc in proliferation, differentiation, and apoptosis of cells; proteins that transport, sense, and distribute zinc and together form a cellular homeostatic system; the coordination chemistry of zinc in metalloproteins; the role of zinc in the brain as a neuromodulator/transmitter; the dependence of the immune system on zinc; zinc homeostasis in the whole human body.

ZIP8 (encoded by Slc39a8) belongs to ZIP (Slc39) family, which are divalent metal-ion importers. ZIP8 is a multiple functional transporter, which facilitates uptake of essential metals zinc, iron, manganese as well as toxic metal cadmium. In our lab, we identified ZIP8 as the first and major transporter for selenium in the form of selenite. ZIP8 is expressed in early developmental stage and indispensable for mammals. Recently, genome-wide association study (GWAS) and studies in mouse model identified that ZIP8 is associated with many human diseases including metabolic disorders (hypotension, Body Mass Index train, cholesterol level), inflammation (asthma, arthritis) and neurological and cardiovascular disorders. However, many mechanisms involved in ZIP8 regulating cellular function and pathologies remain uncharacterized. My overall goal is to characterize the ZIP8 regulatory mechanisms and identify its downstream targets by using cell culture and animal models with gain and loss of ZIP8 function. In the past five years I have successfully characterized ZIP8 regulated phenotype and identified molecules associated with these phenotypes in cells and in mice. My results in gain and loss of ZIP8 cell culture showed ZIP8 regulates epithelial to mesenchymal transition (EMT) phenotype and cytoskeleton re-organization, along with increased cell proliferation and migration rate. Two relevant molecules involved in NF- κ B and Snail2 were identified to be involved. In lung, my results showed ZIP8 regulates actin polymerization and alters lung morphology. My second project is to investigate the role of ZIP8 in cisplatin response. My results in gain and loss of ZIP8 cell culture showed that ZIP8 expression is associated with cisplatin toxicity. I further studied the mechanism and identified that anti-apoptotic protein Bcl-2 is a critical molecule involved in ZIP8 regulation and cisplatin sensitivity. This is a new discovery which may provide a strategy to improve cisplatin therapy efficacy and minimize side effects. Overall, my studies determined uncharacterized mechanism of ZIP8 in regulating cell skeleton, morphology, proliferation and migration, which involves NF- κ B and Snail2 molecules. Moreover, I characterized ZIP8 can promote cisplatin induced apoptosis through Bcl-2 signaling. These findings provide bases for future investigation of ZIP8 associated human diseases.

This book describes the crucial role of "zinc signals" in biological processes on a molecular and physiological basis, discussing future directions and questions underlying this unique phenomenon. To accomplish this, a group of worldwide leaders in the field, who have made outstanding contributions, overview zinc signals from a professional standpoint. Zinc plays an indispensable role in various cellular processes. It regulates a great number of protein functions including transcription factors, enzymes, adapters, and growth factors as a structural or catalytic factor or both. Recently, another function of zinc has received extensive interest and attention because of its potential importance as a signaling mediator. Zinc plays a dynamic role as an intracellular and extracellular signaling factor and thus regulates cellular signaling pathways, which enables communication between cells, conversion of extracellular stimuli to intracellular signals, and control of various intracellular events. These functions of zinc have become recognized as "zinc signals," which play critical roles in physiology, and therefore their imbalance can cause a variety of problems with regard to human health. Because the notion of zinc signals is quite new and no integrative review books focusing on them have yet been published, we believe this book will provide very timely information on the subject and thus should be of importance and interest to a wide range of readers.

This volume provides descriptions of the occurrence of the UPR, methods used to assess it, pharmacological tools and other methodological approaches to analyze its impact on cellular regulation. The authors explain how these methods are able to provide important biological insights. This volume provides descriptions of the occurrence of the UPR, methods used to assess it, pharmacological tools and other methodological approaches to analyze its impact on cellular regulation. The authors explain how these methods are able to provide important biological insights.

The 18th ESACT meeting was celebrated in Granada (Spain) in May 2003, and was entitled "Animal Cell Technology Meets Genomics", in order to reflect that the emerging technologies in the area of genomics, proteomics and other "-omics"-type disciplines will provide key technological assets to increase knowledge and open new horizons in animal cell technology. During the meeting a variety of top-class emerging technologies were presented together with the latest advances in more mature industrial areas. The meeting was opened by a first session devoted to the understanding of basic cellular mechanisms, and four sessions focused on applied aspects of animal cell technology: Cell-based therapies and gene-based therapies, target discovery and biopharmaceuticals. The Granada Meeting has also seen a special focus on forefront industrial case studies. The spirit and scientific excellence of the 18th ESACT meeting is now reflected in different chapters of the book. The book presents, in form of short papers, a high number of the contributions to the meeting, and has been prepared with the aim to provide a relevant reference of the current research efforts in Animal Cell Technology.

This volume provides complete and thorough coverage of the classical and state-of-the-art methods used in cell culture. It also includes basic principles used in the selection of cells for specific scientific study, as well as analytical and procedural techniques. Key Features * Reviews basic principles of cell culture * Gives options and techniques on how to look at cells

Research grants (National Institutes of Health (U.S.)). 1983 |publ 1984Research GrantsResearch and Development ContractsResearch and Development ContractsPublic Health Service Grants and Awards by the National Institutes of HealthNational Institutes of Health Research GrantsResearch and Development ContractsResearch and Development ContractsBiotechnology, a PublicationPublic Health Service Grants and AwardsAnimal Cell Culture MethodsAcademic Press

Animal Cell Electroporation and Electrofusion Protocols provides well-tested protocols for the electroporation of proteins and DNA into insect, fish, and mammalian cells. The collection is distinguished by its coverage of important model cell types from many organisms and tissue types, including Chinese hamster ovary cells, normal human fibroblasts, and human lymphoblastoid cells. It also includes detailed instructions for the growth and preparation of specific cells to achieve optimum animal cell transfection and proven electrofusion techniques for studies of somatic cell genetics and of development, as well as for the generation of monoclonal antibodies. Animal Cell Electroporation and Electrofusion Protocols is an indispensable guide to animal cell electroporation for graduate and postdoctoral students, as well as laboratory directors in basic, applied, biomedical, biotechnological, and clinical research settings. Its extensive reference lists, citations of alternative transfer methods, advice on pitfalls to avoid, and descriptions of expected results ensure readily reproducible success.

This book deals with the surface finishing for corrosion prevention from the viewpoint of environmental friendliness. Surface finishing for metallic materials or by metallic materials has excellent corrosion resistance, wear resistance and good color tones, which have been useful for practical applications so far. However, environmental friendliness and user friendliness have become important factors for practical use since the turn of the century. Surface Finishing Industries are now facing a serious crossroad to continue sustainable developments in the future. Sadly, the concept of environmental friendliness is very new, because from the beginning of this discipline (surface finishing), not many people considered the environmental effects so seriously, but sought mainly for the functions, performance, characteristics, and economic profits. Since the biological evaluation processes are very advanced and still debated, this book is very unique and advanced. This book aims to let university students know and learn the concept of environmental friendliness and its relation to surface treatment products based on the fundamental knowledge about conventional corrosion control and surface finishing. The textbook will be used most effectively with subjects such as surface science, surface engineering, mechanical materials, etc. for those studying mechanical engineering, materials engineering and chemical engineering. It is also applicable to practical engineers and researchers in the industrial world as well as the academic one. Throughout this book, readers learn and appreciate the environmentally friendly approaches that are presented for corrosion control and surface finishing.

Essentials of Medical Geology reviews the essential concepts and practical tools required to tackle environmental and public health problems. It is organized into four main sections. The first section deals with the fundamentals of environmental biology, the natural and anthropogenic sources of health elements that impact health and illustrate key biogeochemical transformations. The second section looks at the geological processes influencing human exposure to specific elements, such as radon, arsenic, fluorine, selenium and iodine. The third section presents the concepts and techniques of pathology, toxicology and epidemiology that underpin investigations into the human health effects of exposure to naturally occurring elements. The last section provides a toolbox of analytical approaches to environmental research and medical geology investigations. Essentials of Medical Geology was first published in 2005 and has since won three prestigious rewards. The book has been recognized as a key book in both medical and geology fields and is widely used as textbook and reference book in these fields. For this revised edition, editors and authors have updated the content that evolved a lot during 2005 and added two new chapters, on public health, and agriculture and health. This updated volume can now continue to be used as a textbook and reference book for all who are interested in this important topic and its impacts the health and wellbeing of many millions of people all over the world. · Addresses key topics at the intersection of environmental science and human health · Developed by 60 international experts from 20 countries and edited by professionals from the International Medical Geology Association (IMGA) · Written in non-technical language for a broad spectrum of readers, ranging from students and professional researchers to policymakers and the general public · Includes color illustrations throughout, references for further investigation and other aids to the reader

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