Fluorescence Based Viability Assays For The Countess Ii Fl

Development and validation of in vitro microtiter-based viability assay incorporating resazurin for drug susceptibility testing and discovery of bioactive agents against Madurella mycetomatisShereen O. Abd Algaffar1, Wendy W. J. van de Sande2 and Sami A. Khalid1 1Faculty of Pharmacy, University of Science & Technology,2Erasmus MC, Department of Medical Microbiology and Infectious Diseases, Rotterdam, The Netherlands. ObjectivesAntifungals resistant and non-availability of a therapeutically effective drug against Madurella mycetomatis which is one of the most neglected tropical diseases prompted us to develop a rapid, reproducible, and inexpensive in vitro viability assay for drug susceptibility testing and as an indispensable tool in the drug discovery of novel bioactive agents against this disfiguring infectious disease.1 Resazurin (Alamar blue) assay offers a simple and affordable method especially in resource-limited settings along the u201cmycetoma endemic belt\u201d and it is amenable to multiplexing applications with other assays, hence the incubation period is flexible, and the data can be collected using either fluorescence or absorbance detection.MethodsResazurin dye (0.15mg/ml) was employed as viability indicator in the present in vitro susceptibility testing of nine genetically identified clinical isolates of M. mycetomatis 2 using seven standard antifungal agents (Amphotericin B, Caspofungin, Fluconazole, Itraconazole, Ketoconazole, Voriconazole and Terbinafine). This assay was validated by comparison with XTT assay.3 The fungal inoculum used was ranging between 0.4 x 104 to 5 x 104 CFU/ml with 68-72% transmission. The mechanism of the resazurin method is based on the mitochondrial enzymes in the live cells that convert blue-coloured resorufin proportionally to the number of metabolically active, viable cells present in a fungal population. The main differences between the two assays are revolving around that resazurin is added on the first day of incubation with distinctive colour on the 2-7th day of its incubation at 30-37 oC degree whereas XTT is added at the end of incubation period. ResultsA sharp, reproducible end-point was detected resulting from the conversion of resazurin to resorufin. Visual detection of MIC provided quantitatively identical absorbance measurements in resazurin assay. Comparison of the overall MIC values of resazurin assay with its counterpart XTT assay nearly provided the same MIC values in some isolates. The MIC of Amphotericin B ranges between 64-0.5ug/ml while the azoles except for Fluconazole, exhibited varying inhibitory effect on different isolates. Itraconazole and Posaconazole exhibited the lowest MIC value (>8-0.125ug/ml). Caspofungin and Terbinafine, however, showed weak inhibition on most of the isolates examined (MIC >256ug/ml).ConclusionA simple, reproducible resazurin-based in vitro assay was optimized for susceptibility testing of M. mycetomatis. The major advantages of the resazurin reduction assay are that it is relatively more sensitive than tetrazolium assays besides exhibiting the smallest variability across linear range, while much larger variations were observed for the MTT assays. References 1.Khalid SA. 2nd ResNet NPND workshop on natural products against neglected diseases, November 25-28th, 2014, Rio de Janeiro, Brazil.2,tVan de Sande, WW. J et al. Journal of Clinical Microbiology, 43(9), 4349-56. 2005.3.tAhmed, A.O. et al. Antimicrobial Agents and Chemotherapy, 48 (7), 2742-46, 2004.

Fluorescence methods play a leading role in the investigation of biological objects. They are the only non-destructive methods for investigating living cells and microorganisms in vivo. Using intrinsic and artificial fluorescence methods provides deep insight into mechanisms underlying physiological and biochemical processes. This book covers a wide range of modern methods involved in experimental biology. It illustrates the use of fluorescence microscopy and spectroscopy, confocal laser scanning microscopy, flow cytometry, delayed fluorescence, pulse-amplitude-modulation fluorometry, and fluorescent dye staining protocols. This book provides an overview of practical and theoretical aspects of fluorescence methods and their successful application in the investigation of static and dynamic processes in living cells and microorganisms.

This volume provides an overview of commonly used methods and protocols for cell fitness indicators. Chapters detail biochemical, fluorescence and luminescence-based strategies, computational, and label-free methodologies for assaying cellular viability by means of e.g. viscoelastic properties, impedance and multiphoton microscopy. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Cell Viability Assays: Methods and Protocols aims to ensure successful results in the further study of this vital field.

The orthodontic literature includes many articles on basic science and engineering research techniques, but clinicians are typically unfamiliar with the principles underlying these techniques and may also lack the background knowledge required for a full appreciation of their role. This book comprehensively reviews a wide array of the research methods most frequently encountered in the literature, encompassing the areas of materials science and clinical and biological research. The various methods and techniques are carefully described, and their indications and limitations are explained. All of the information is up to date, reflecting latest developments in the field. For practicing professionals, Research Methods in Orthodontics will be an ideal introduction to instrumental analysis and basic science research methods. It will also serve as an excellent reference guide for researchers. ?

Nanotoxicology

Drug Discovery and Development

Handbook of Brain Tumor Chemotherapy

A Practical Guide to Assay Development and High-Throughput Screening in Drug Discovery

Chemosensitivity

A Non-Labeling Chondrocyte Viability Assay Based On Two-Photon Autofluorescence Imaging

INTRODUCTION: Articular cartilage provides a smooth, lubricated surface to absorb impact and distribute loads during movement so that underlying bone is protected. This function is facilitated by the cartilage extracellular matrix (ECM), which is a macromolecular framework given rise from three distinct classes of macromolecules: collagens (predominantly type II collagens), proteoglycans (mainly aggrecan), and a variety of non-collagenous proteins. Chondrocytes are perhaps the only cellular components in cartilage and play the critical role in maintaining the homeostasis c cartilage. The chondrocyte viability is an important measure of the quality of articular cartilage. The current viability assays all relay on dye labeling thus are impossible to assess articular cartilage in vivo or to perform the longitudinal study. Fluorescent metabolic coenzymes, such as adenine dinucleotide (phosphate) (NAD(P)H) and flavin adenine dinucleotide (FAD), are intrinsic fluorophores and have long been used in imaging metabolic states of cells with either one-photon or two-photon excitation[1]. Several studies [2,3] suggested that the fluorescence intensity of the coen possibly reflected the cell viability. However, no evidence has been provided to demonstrate that the autofluorescence can be directly used to assess the chondrocyte viability on intact tissues. Our recent imaging studies have demonstrated that two-photon excited autofluorescence (TPAF) provided reliable information for assessing chondrocyte viability in intact samples. METHODS: Male Sprague-Dawley rats (n=4; 4-6 months, male; approved by the MUSC Institutional Animal Care and Use Committee) were used in this study. Tibial condyles were harvested in whole immedi euthanasia. The samples were then placed under a laser scanning two-photon fluorescence microscope (Olympus FV1200, inverted) with the cartilage surface facing down. The sample was held by a customized holder and maintained in DPBS (Dulbeccou2019s Phosphate-Buffered Saline, Corning) in glass bottom petri dish. For autofluorescence imaging, the excitation wavelength was tuned to 740nm. Two fluorescence recording channels collected fluorescence in the bands of violet (420-460nm) and red (575-630nm), which selected NAD(P)H and FAD fluorescence respec Immediately after autofluorescence imaging, the sample was kept untouched while Calcein-AM (2 u03bcM) & Ethidium homodimer-1 (8 u03bcM) solutions were gently poured into the sample petra dish and incubated samples at 37 u2103 for 30 min. Then the laser was tuned to 800nm and filters were switched to ones with passing bands of green (495-540nm) and red (575-630nm) for imaging fluorescence from Calcein and Ethidium Homodimer-1 respectively. The same area as in the autofluorescence imaging was imaged with staining. Live cells and dead cells were able to by their appearance in the green or red channels. For confirmation of cell borders, second harmonic generation (SHG) images were recorded on the same sample with the laser tuned to 860 nm. Type II collagen in cartilage gave out a strong SHG signal, which marked the ECM region. RESULTS: Figure 1(a) shows a typical merged red-green image based on TPAF signals. In the TPAF image, one population of cells exhibit red colors due to distinguishable low intensity in the green channel while the other population exhibit much brighter green color. We hypothesized that the were dead cells while the green cells were live cells. To test the hypothesis, we used the commonly used live/dead assay with dye labeling as a gold standard to determine the status of each cell. We performed the study on four samples from different animals. The staining results were reviewed by two independent observers and 1617 cells were selected upon the consensus of the cell status. These cells were examined again based on their TPAF images by another two independent observers blinded from the staining results. The sensitivity and specificity of the TPAF assay all four samples. The results are shown in Table 1. The average sensitivity and specificity are 0.96u00b10.03 and 0.91u00b10.05 respectively.DISCUSSION: For some samples, FAD fluorescence was too weak to be used for identifying cells. The SHG images had to aid in locating the cell region. In this TPAF assay, we used visual judgment to determine the cell viability. We are currently working on quantitative measures for the semi-automated analysis. The fully automated analysis relies on cell segmentation and quantitative classification. Deep learning approaches may finc here. SIGNIFICANCE/CLINICAL RELEVANCE: Traumatic and degenerative lesions eventually progress to osteoarthritis (OA), a leading source of disability worldwide. The chondrocyte viability provides an important indicator for determining the healthiness of articular cartilage. This information is of importance in making a decision on treatment plans or determining the quality of osteochondral allografts. The TPAF assay reported here provides a non-labeling and non-destructive method for assessing chondrocyte viability in intact cartilage samples. REFERENCES: [1] Piston, W., B. R. Masters, and W. W. Webb. Journal of microscopy 178.1 (1995): 20-27. [2] Dittmar, Roman, et al. Tissue Engineering Part C: Methods 18.3 (2011): 198-204.[3] Chen, Leng-Chun, et al. Biomaterials 35.25 (2014): 6667-6676.

The RTgill-W1 cell line assay describes a 24-well plate format fish cell line acute toxicity test using the permanent cell line from rainbow trout (Oncorhynchus mykiss) gill, RTgill-W1. After 24 h of exposure to the test chemical, cell viability is assessed based on three fluorescent cell viability indicator dyes, measured on the same set of cells. Resazurin enters the cells in its non-fluorescent form and is converted to the fluorescent product, resorufin, by mitochondrial, microsomal or cytoplasmic oxidoreductases.

The rate at which toxicological data is generated is continually becoming more rapid and the volume of data generated is growing dramatically. This is due in part to advances in software solutions and cheminformatics approaches which increase the availability of open data from chemical, biological and toxicological and high throughput screening resources. However, the amplified pace and capacity of data generation achieved by these novel techniques presents challenges for organising and analysing data output. Big Data in Predictive Toxicology discusses these challenge opportunities of new techniques encountered in data science. It addresses the nature of toxicological big data, their storage, analysis and interpretation. It also details how these data can be applied in toxicity prediction, modelling and risk assessment. This title is of particular relevance to researchers and postgraduates working and studying in the fields of computational methods, applied and physical chemistry, cheminformatics, biological sciences, predictive toxicology and safety and hazard assessment.

The development of suitable assays, the integration of appropriate technology, and the effective management of the essential infrastructure are all critical to the success of any high-throughput screening (HTS) endeavor. However, few scientists have the multidisciplinary experience needed to control all aspects of an HTS drug discovery project. A P

Neurobiology of Huntington's Disease

Mammalian Cell Viability

Toxicity Evaluation of Nanomedicine Applications

A Guide to Fluorescent Probes and Labeling Technologies, 11th Edition

Ubiquitin and the Chemistry of Life

Fluorescence Methods for Investigation of Living Cells and Microorganisms

The need to screen targets faster and more efficiently, coupled with advances in parallel and multiplex chemical synthesis, has contributed to the increasing use of multiwell assays for drug discovery. The Handbook of Assay Development in Drug Discovery is a reference that describes the complete armament of tools currently available for performing various assay techniques. Featuring contributions from assay developers in the pharmaceutical and vendor communities, the book presents descriptions of methods, laboratory guidelines and protocols used to perform such methods, specific examples of each assay system, and troubleshooting tools. The handbook describes biochemical assay classes as well as non-class specific assay development for cell-based assays. It covers a wide range of target classes—including kinases, proteases, nuclear receptors, and GPCRs—and describes currently employed methods and assay types, such as radioligand binding assays, image analysis assays, enzyme fragment complementation, and bioluminescent and fluorescent-based assays. Designed as a guide to running an assay from start to finish, the Handbook of Assay Development in Drug Discovery is an ideal bench top companion for discovery researchers, laboratory managers, academics, and other scientists involved in drug discovery screening, lead profiling, therapeutic target evaluation, and assay development and implementation in the pharmaceutical and biotechnology industries. Daniel E. Levy, editor of the Drug Discovery Series, is the founder of DEL BioPharma, a consulting service for drug discovery programs. He also maintains a blog that explores organic chemistry.

This extensive book brings together leading melanoma researchers from across the world and highlights many of the cutting-edge protocols and experimental systems currently being used to investigate questions surrounding this disease. The volume opens with sections on 2D and 3D cell culture-based approaches for studying melanoma biology, and continues with collections of chapters examining various approaches for detecting, isolating, and characterizing circulating melanoma cells, circulating tumor DNA, and exosomes, as well as experimental procedures for studying and detecting melanoma metastasis in both pre-clinical and clinical settings, bioinformatics-based approaches, protocols for quantifying and characterizing immune cell infiltrates in both melanoma tumors and tertiary lymphoid structures, and development and evaluation of therapeutic strategies for melanoma treatment. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and comprehensive, Melanoma: Methods and Protocols aims to serve basic research scientists and clinicians who bring questions from the clinic into the lab in order to translate observations in the laboratory into improved patient care for this highly malignant form of cancer. Chapter 14 is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

Flow cytometry continually amazes scientists with its ever-expanding utility. Advances in flow cytometry have opened new directions in theoretical science, clinical diagnosis, and medical practice. The new edition of Flow Cytometry: First Principles provides a thorough update of this now classic text, reflecting innovations in the field while outlining the fundamental elements of instrumentation, sample preparation, and data analysis. Flow Cytometry: First Principles, Second Edition explains the basic principles of flow cytometry, surveying its primary scientific and clinical applications and highlighting state-of-the-art techniques at the frontiers of research. This edition contains extensive revisions of all chapters, including new discussions on fluorochrome and laser options for multicolor analysis, an additionalsection on apoptosis in the chapter on DNA, and new chapters onintracellular protein staining and cell sorting, including high-speed sorting and alternative sorting methods, as well as traditional technology. This essential resource: Assumes no prior knowledge of flow cytometry Progresses with an informal, engaging lecture style from simpleto more complex concepts Offers a clear introduction to new vocabulary, principles of instrumentation, and strategies for data analysis Emphasizes the theory relevant to all flow cytometry, with examples from a variety of clinical and scientific fields Flow Cytometry: First Principles, Second Edition provides scientists, clinicians, technologists, and students with the knowledge necessary for beginning the practice of flow cytometry and for understanding related literature.

The first volume in a new series dedicated to protein degradation, this book lays the foundations of targeted protein breakdown via the ubiquitin pathway. The outstanding importance of the ubiquitin pathway has been recognized with the 2004 Nobel Prize in Chemistry for Aaaron Chiechanover, Avram Hershko, and Irwin Rose. Aaron Ciechanover is one of the editors of this series, and Avram Hershko has contributed to the opening chapter of the present volume. Drawing on the the expertise of two Nobel prize winners, this handy reference compiles information on the initial steps of the ubiquitin pathway. Starting out with a broad view of protein degradation and its functions in cellular regulation, it then goes on to examine the molecular mechanisms of ubiquitin conjugation and recycling in detail. All currently known classes of ubiquitin protein ligases are treated here, including latest structural data on these enzymes. Further volumes in the series cover the function of the proteasome, and the roles of the ubiquitin pathway in regulating key cellular processes, as well as its pathophysiological disease states. Required reading for molecular biologists, cell biologists and physiologists with an interest in protein degradation.

Cytotoxicity

Cryptosporidium Parvum Viability Assay

Nanotoxicity

Handbook of Assay Development in Drug Discovery

Prevention and Antibacterial Applications of Nanomaterials

Cell biology is a multidisciplinary scientific field that its modern expansion in new knowledge and applications owes to important support of new technologies with the rapid development, such as ICTs. By integrating knowledge from nano-, molecular, micro-, and macroareas, it represents a strong foundation for almost all biological sciences and disciplines, as well as for biomedical research and application. This book is a compilation of inspiring reviews/original studies, which are divided into sections: New Methods in Cell Biology, Molecular and Cellular Regulatory Mechanisms, and Cellular Basis of Disease and Therapy. The book will be very useful for students and beginners to gain insight into new area, as well as for experts and scientists to find new facts and expand their scientific horizons through biological sciences and biomedicine.

Compensating for cytotoxicity in the multicellular organism by a certain level of cellular proliferation is the primary aim of homeostasis. In addition, the loss of cellular proliferation control (tumorigenesis) is at least as important as cytotoxicity, however, it is a contrasting trauma. With the disruption of the delicate balance between cytotoxicity and proliferation, confrontation with cancer can inevitably occur. This book presents important information pertaining to the molecular control of the mechanisms of cytotoxicity and cellular proliferation as they relate to cancer. It is designed for students and researchers studying cytotoxicity and its control.

The field of nanomedicine has risen quickly due to the increasing number of designer-made nanomaterials. These nanomaterials have the potential to manage diseases and change the way medicine is currently studied. However, the increased practice of using nanomaterials has shed light on how many concepts of nanomedicine and nanotoxicity have been overlooked. Nanotoxicology: Toxicity Evaluation of Nanomedicine Applications addresses the existing gaps between nanomedicine and nanotoxicity. This book also brings together up-to-date knowledge on advances toward safe-by-design nanomaterials and existing toxicity challenges. This book delivers a comprehensive coverage in the field with fundamental understanding, serving as a platform to convey essential concepts of nanotoxicology and how these concepts can be employed to develop advanced nanomaterials for a range of biomedical applications. This book is an effort to answer some of the thoughtful nanotoxicological complications and their auspicious probable solutions with new approaches and careful toxicity assessment. Key Features: Reveals novel nanoscale approaches, toxicity assessment, and biomedical applications Includes importance of nanotoxicity concepts in developing smart nanomaterials Highlights unique contributions and "A to Z" aspects on the state-of-the-art from global leaders Offers a complete package to learn fundamentals with recommendations on nanomaterials toxicity and safe-by-design nanomedicines Nanotoxicology: Toxicity Evaluation of Nanomedicine Applications illuminates the high potential of many innovative nanomaterials, ultimately demonstrating them to be promising substitutes for available therapies that can be effectively used in fighting a myriad of biomedical complications. Further, this book reports legal, ethical, safety, and regulatory issues associated with nanomaterials, which have often been neglected, if not overlooked in literature and limiting clinical translation at nanoscale level. It will equip readers with cutting-edge knowledge of promising developments in nanomedicine and nanotoxicology, along with potential future prospects.

Bioluminescence is the natural phenomenon found in light emitting organisms while chemiluminescence is a similar phenomenon in chemical reactions. This book contains the proceedings of one of the world's leading conferences in this field of study. As with previous, well-received publications of this conference, this book showcases the conference's growing importance.

Calcium Signaling

Alternatives to the Use of Live Vertebrates in Biomedical Research and Testing

Bioluminescence and Chemiluminescence

A Guide to Understanding Orthodontic Research

Cell-Based Assays for High-Throughput Screening

Applications in Biology

Whether the question is one of basic cell survival, or whether it is being used to correlate cell number to some other factor such as matrix synthesis, an estimate of cell viability is universally required. In Mammalian Cell Viability: Methods and Protocols, experts in the field describe methods from the most basic which can be performed in any laboratory, to some which require specific pieces of equipment. Initially focusing on methods for monolayer and suspension cells, later chapters describe methods for determining viability within tissue sections and 3 dimensional culture systems. Finally, methods requiring highly specialized equipment are described in order to explain what is possible. Written in the highly successful Methods in Molecular BiologyTM series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and vital tips on troubleshooting and avoiding known pitfalls. Practical and adaptable, Mammalian Cell Viability: Methods and Protocols serves as a self-contained laboratory manual useful to both experienced researchers and those new to this incredibly important and influential field.

As the use of high-throughput screening expands and creates more interest in the academic community, the need for detailed reference materials becomes ever more pressing. Cell-Based Assays for High-Throughput Screening: Methods and Protocols aims to fill an important part of this need by providing an easily accessible reference volume for cell-based phenotypic screening. Leading researchers in the field contribute state-of-the-art methods with actionable protocols covering four major areas of study: model biological systems, screening modalities and assay systems, detection technologies, and approaches to data analysis. Written in the highly successful Methods in Molecular BiologyTM series format, each chapter includes a brief introduction to the subject, lists of necessary materials and reagents, step-by-step laboratory protocols, and a Notes section detailing tips on troubleshooting and avoiding known pitfalls. Cutting-edge and easy-to-use, Cell-Based Assays for High-Throughput Screening: Methods and Protocols presents an overview of relevant approaches, enabling the direct application of existing methods to new discoveries while also inspiring researchers to approach their screening projects in a conceptually modular fashion, enhancing the power to discover through new combinations of existing approaches.

Volume 1 provides a panel of 16 in vitro measures of chemosensitivity in adherent and non-adherent cells for single agents and combinations of agents. In addition to immunohistochemical and imaging approaches, these assays include clonogenic, colorimetric, fluorometric, and physiological assays.

This handbook covers the most commonly used techniques for measuring plant response to biotic and abiotic stressing factors, including: in vitro and in vivo bioassays; the study of root morphology, photosynthesis (pigment content, net photosynthesis, respiration, fluorescence and thermoluminiscence) and water status; thermal imaging; the measurement of oxidative stress markers; flow cytometry for measuring cell cycle and other physiological parameters; the use of microscope techniques for studying plant microtubules; programmed-cell-death; last-generation techniques (metabolomics, proteomics, SAR/QSAR); hybridization methods; isotope techniques for plant and soil studies; and the measurement of detoxification pathways, volatiles, soil microorganisms, and computational biology.

Principles and Methods

Culture of Animal Cells

Flow Cytometry and Cell Sorting

Lactic Acid Bacteria

Fluorescence Microscopy in Life Sciences

Chemical Tools for Imaging, Manipulating, and Tracking Biological Systems: Diverse Methods for Optical Imaging and Conjugation

Focusing on modern sperm function testing, this guide is essential in selecting sperm that will produce viable and healthy embryos.

Nanotoxicity: Prevention, and Antibacterial Applications of Nanomaterials focuses on the fundamental concepts for cytotoxicity and genotoxicity of nanomaterials. It sheds more light on the underlying phenomena and fundamental mechanisms through which nanomaterials interact with organisms and physiological media. The book provides good guidance for toxic prevention methods and management in the manufacture/application/disposal. The book also discusses the potential applications of nanomaterials-based antibiotics. The potential toxic effects of nanomaterials result not only from the type of base materials, but also from their size/ ligands/surface chemical modifications. This book discusses why different classes of nanomaterials display toxic properties, and what can be done to mitigate this toxicity. It also explores how nanomaterials are being used as antimicrobial agents, being used to purify air and water, and counteract a range of infectious diseases. This is an important reference for materials scientists, environmental scientists and biomedical scientists, who are seeking to gain a greater understanding of how nanomaterials can be used to combat toxic agents, and how the toxicity of nanomaterials themselves can best be mitigated. Explains the underlying phenomena and fundamental mechanisms through which nanomaterials interact with organisms and physiological media Outlines major methods for mitigating and prevention of nanotoxicity Discusses the applications of nanomaterials-based antibiotics

Biochemical Ecotoxicology: Principles and Methods presents practical approaches to biochemical ecotoxicology experiments for environmental protection and conservation. With its methodical, stepped approach this essential reference introduces readers to current techniques for toxicity endpoint testing, suitable for laboratories of any size and budget. Each chapter presents a state-of-the-art principle, a quick and inexpensive procedure (including appropriate reagents), case studies, and demonstrations on how to analyze your results. Generic techniques are covered, suitable for a variety of organisms, as well as high-throughput techniques like quantitative polymerase chain reactions and enzyme-linked immunoassays. Cutting-edge approaches, including gPCR arrays and lipidomic techniques, are also included, making this is an essential reference for anyone who needs to assess environmental toxicity. Practical, cost-effective approaches to assess environmental toxicity endpoints for all types of organism Presents theory, methods, case studies and information on how to analyze results State-of-the-art techniques, such as ' omics ' approaches to toxicology

Fluorescence Microscopy is a precise and widely employed technique in many research and clinical areas nowadays. Fluorescence Microscopy In Life Sciences introduces readers to both the fundamentals and the applications of fluorescence microscopy in the biomedical field as well as biological research. Readers will learn about physical and chemical mechanisms giving rise to the phenomenon of luminescence and fluorescence in a comprehensive way. Also, the different processes that modulate fluorescence efficiency and fluorescence features are explored and explained.

Established May 3rd, 1830, at the House of Mr. William Hauxworth, the Ship Inn, Briggate, Leeds

Protein Degradation

Definition, Identification, and Cytotoxic Compounds

Big Data in Predictive Toxicology

Current and Future Industrial Applications

Microbiological and Functional Aspects, Fourth Edition

Through four editions, Lactic Acid Bacteria: Microbiological and Functional Aspects, has provided readers with information on the how's and why's lactic acid-producing fermentation improves the storability, palatability, and nutritive value of perishable foods. Thoroughly updated and fully revised, with 12 new chapters, the Fifth Edition covers regulatory aspects globally, new findings on health effects, properties and stability of LAB as well as production of target specific LAB. The new edition also addresses the technological use of LAB in various fermentations of food, feed and beverage, and their safety considerations. It features the detailed description of the main genera of LAB as well as such novel bacteria as fructophilic LAB and novel probiotics and discusses such new targets as cognitive function, metabolic health, respiratory health and probiotics. Key Features: In 12 new chapters, findings are presented on health effects, properties and stability of LAB as well as production of target specific LAB Covers such novel bacteria as fructophilic LAB and novel probiotics Presents new discoveries related to the mechanisms of lactic acid bacterial metabolism and function Covers the benefits of LAB, both in fermentation of dairy, cereal, meat, vegetable and silage, and their health benefits on humans and animals Discusses the less-known role of LAB as food spoilers Covers the global regulatory framework related to safety and efficacy

In 1993, the genetic mutation responsible for Huntington's disease (HD) was identified. Considered a milestone in human genomics, this discovery has led to nearly two decades of remarkable progress that has greatly increased our knowledge of HD, and documented an unexpectedly large and diverse range of biochemical and genetic perturbations that seem to result directly from the expression of the mutant huntingtin gene. Neurobiology of Huntington's Disease: Applications to Drug Discovery presents a thorough review of the issues surrounding drug discovery and development for the treatment of this paradigmatic neurodegenerative disease. Drawing on the expertise of key researchers in the field, the book discusses the basic neurobiology of Huntington's disease and how its monogenic nature confers enormous practical advantages for translational research, including the creation of robust experimental tools, models, and assays to facilitate discovery and validation of molecular targets and drug candidates for HD. Written to support future basic research as well as drug development efforts, this volume: Covers the latest research approaches in genetics, genomics, and proteomics, including high-throughput and high-content screening Highlights advances in the discovery and development of new drug therapies for neurodegenerative disorders Examines the practical realities of preclinical testing, clinical testing strategies, and, ultimately, clinical usage While the development of effective drug treatments for Huntington's disease continues to be tremendously challenging, a highly interactive and cooperative community of researchers and clinical investigators now brings us to the threshold of potential breakthroughs in the quest for therapeutic agents. The impressive array of drug discovery resources outlined in the text holds much promise for treating this devastating disease, providing hope to long-suffering Huntington's disease patients and their families.

This volume contains a unique selection of chapters covering a wealth of contemporary topics in this ubiquitous and diverse system of cell signaling. It offers much more than the accessibility and authority of a primary text book, exploring topics ranging from the fundamental aspects of calcium signaling to its varied clinical implications. It presents comprehensive discussion of cutting-edge research alongside detailed analysis of critical issues, at the same time as setting out testable hypotheses that point the way to future scientific endeavors. The contributions feature material on theoretical and methodological topics as well as related subjects including mathematical modeling and simulations. They examine calcium signaling in a host of contexts, from mammalian cells to bacteria, fruit fly and zebrafish. With much of interest to newcomers to the field as well as seasoned experts, this new publication is both wide-ranging and authoritative. The chapter "Calcium Signaling: From Basic to Bedside" is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

It is very important for scientists all over the globe to enhance drug discovery research for better human health. This book demonstrates that various expertise are essential for drug discovery including synthetic or natural drugs, clinical pharmacology, receptor identification, drug metabolism, pharmacodynamic and pharmacokinetic research. The following 5 sections cover diverse chapter topics in drug discovery: Natural Products as Sources of Leading Molecules in Drug Discovery; Oncology and Drug Discovery; Receptors Involvement in Drug Discovery; Management and Development of Drugs against Infectious Diseases; Advanced Methodology.

Perspectives for the 21st Century

Manual of Sperm Function Testing in Human Assisted Reproduction

Melanoma

Applications to Drug Discovery

Quantum Dots

Advances in Plant Ecophysiology Techniques

Rules of the Catholic Friendly SocietyEstablished May 3rd, 1830, at the House of Mr. William Hauxworth, the Ship Inn, Briggate, LeedsA Non-Labeling Chondrocyte Viability Assay Based On Two-Photon Autofluorescence Imaging

The analysis and sorting of large numbers of cells with a fluorescence-activated cell sorter (FACS) was first achieved some 30 years ago. Since then, this technology has been rapidly developed and is used today in many laboratories. A Springer Lab Manual Review of the First Edition: "This is a most useful volume which will be a welcome addition for personal use and also for laboratories in a wide range of disciplines. Highly recommended." CYTOBIOS

Cyclodextrins in Pharmaceutics, Cosmetics, and Biomedicine covers a wide range of knowledge on cyclodextrins, from an overview of molecular and supramolecular aspects of cyclodextrin physicochemistry, to the latest outcomes in cyclodextrin use and future possibilities in the employment of these systems. This book focuses on the derivatives and physicochemical and biological properties of cyclodextrins, and considers drug delivery through topical, mucosal, and oral via cyclodextrin complexes.

Treatment of patients with a brain tumor remains one of the most challenging and difficult areas of modern oncology. Recent advances in the molecular biology of these neoplasms have improved our understanding of the malignant phenotype and have lead to the development of novel forms of chemotherapy, including "targeted agents. The Handbook of Brain Tumor Chemotherapy reviews the state-of-the-art of chemotherapy development and clinical treatment of patients with this devastating disease. Handbook of Brain Tumor Chemotherapy offers a unique cutting-edge compendium of basic science and clinical information on the subject of brain tumor chemotherapy, reviewing what has been accomplished thus far and how the field will continue to evolve with the development of more specific and efficacious chemotherapeutic agents. This book represents the most complete single-volume resource available for information on the subject of brain tumor chemotherapy. Provides the most up to date information regarding conventional forms of cytotoxic chemotherapy, as well as the basic science and clinical application of molecular therapeutics, for the treatment of brain tumors Broadly appeals to anyone interested in the field of Neuro-Oncology and in the treatment of patients with brain tumors Useful to clinicians interested in a thorough overview of the use of chemotherapy in patients with a broad range of brain tumors as well as serving as a source of background information to basic scientists and pharmaceutical researchers with an interest in the molecular therapeutics of brain tumors

OECD Guidelines for the Testing of Chemicals, Section 2 Test No. 249: Fish Cell Line Acute Toxicity - The RTgill-W1 cell line assay

Methods and Protocols

Rules of the Catholic Friendly Society

Cell Biology

The Molecular Probes Handbook

An Annotated Bibliography

Chemical Tools for Imaging, Manipulating, and Tracking Biological Systems: Diverse Methods for Optical Imaging and Conjugation, Volume 639, the latest release in the Methods in Enzymology series, continues the legacy of this premier serial with quality chapters authored by leaders in the field. Chapters in this new release include Fluorogenic detection of protein aggregates in live cells using the AggTag method, Synthesis and Application of Ratiometric Probes for Hydrogen Peroxide Detection, Chemical Tools for Multicolor Protein FRET with Tryptophan, Fluorescing Isofunctional Ribonucleosides for Adenosine Deaminase Activity and Inhibition, Temporal profiling establishes a dynamic S-palmitoylation cycle, Solvation-guided design of fluorescent probes for discrimination of amyloids, and much more. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Methods in Enzymology series Includes the latest information on retinoid signaling pathways

While lactic acid-producing fermentation has long been used to improve the storability, palatability, and nutritive value of perishable foods, only recently have we begun to understand just why it works. Since the publication of the third edition of Lactic Acid Bacteria: Microbiological and Functional Aspects, substantial progress has been made in a number of areas of research. Completely updated, the Fourth Edition covers all the basic and applied aspects of lactic acid bacteria and bifidobacteria, from the gastrointestinal tract to the supermarket shelf. Topics discussed in the new edition include: Revised taxonomy due to improved insights in genetics and new molecular biological techniques New discoveries related to the mechanisms of lactic acid bacterial metabolism and function An improved mechanistic understanding of probiotic functioning Applications in food and feed preparation Health properties of lactic acid bacteria The regulatory framework related to safety and efficacy Maintaining the accessible style that made previous editions so popular, this book is ideal as an introduction to the field and as a handbook for microbiologists, food scientists, nutritionists, clinicians, and regulatory experts.

This masterful third edition of Freshney's Culture of Animal Cells updates and considerably expands the scope of its predecessor and still enables both the novice and the experiences researcher to apply the basic and more sophisticated techniques of tissue culture. New Topics covered include: the use of molecular techniques in cell culture, such as DNA fingerprinting, fluorescence in situ hybridization, and chromosome painting cell interactions in cell culture new methods for separating cells new or refined methods for accessing cytotoxicity, viability, and mutagenicity experimental details for culture of specialized cells types not covered in previous editions new or refined techniques for visualizing clues, including time-lapse photography and confocal microscopy The revised and expanded third edition offers the following features: over 350 new reference to the primary literature an international list of cell banks an international listing of reagants and commercial supplies a

subject index a glossary Also available: 0471169021 Culture of Animal Cells: A Multimedia Guide CD-ROM $150 est. From the reviews: "I strongly recommend this volume for any laboratory wishing to culture mammalian cells" - Biotechnology "It is not very often that it is possible to say of a book, 'I don't know how I managed without it previously.' Here is such a book" - Cell Biology International Reports
The most complete fluorescent labeling and detection reference available, The Molecular Probes HandbookA Guide to Fluorescent Probes and Labeling Technologies contains over 3,000 technology solutions representing a wide range of biomolecular labeling and detection reagents. The significantly revised 11th Edition features extensive references, reorganized content, and new technical notes and product highlights.
Cyclodextrins in Pharmaceutics, Cosmetics, and Biomedicine
Development and Validation of in Vitro Microtiter-based Viability Assay Incorporating Resazurin for Drug Discovery and Susceptibility Testing Against Madurella Mycetomatis
New Insights
Flow Cytometry
Microbiological and Functional Aspects
Fluorescence Techniques to Detect and to Assess Viability of Plant Pathogenic Bacteria

This third edition provides revised and expanded protocols of consolidated approaches as well as new trends in the field. Chapters guide readers through new approaches to optimize Quantum Dots ' (QD) properties, to evaluate their quantum yields, important features about preparative processes and characterizations of QDs, methods related to QDs for live cell applications, and the versatility of QDs in the bioanalytical and biosensing field. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls.

First Principles
Cell Viability Assays
Biochemical Ecotoxicology
Research Methods in Orthodontics
From Molecules to Medicine