

Drug Transport In Antimicrobial And Anticancer

The use of drugs in food animal production has resulted in benefits throughout the food industry; however, their use has also raised public health safety concerns. The Use of Drugs in Food Animals provides an overview of why and how drugs are used in the major food-producing animal industries--poultry, dairy, beef, swine, and aquaculture. The volume discusses the prevalence of human pathogens in foods of animal origin. It also addresses the transfer of resistance in animal microbes to human pathogens and the resulting risk of human disease. The committee offers analysis and insight into these areas Monitoring of drug residues. The book provides a brief overview of how the FDA and USDA monitor drug residues in foods of animal origin and describes quality assurance programs initiated by the poultry, dairy, beef, and swine industries. Antibiotic resistance. The committee reports what is known about this controversial problem and its potential effect on human health. The volume also looks at how drug use may be minimized with new approaches in genetics, nutrition, and animal management. November

This forward-looking book focuses on the recent advances in nanomedicine and drug delivery. It outlines the extraordinary new tools that have become available

in nanomedicine and presents an integrated set of perspectives that describe where we are now and where we should be headed to put nanomedicine devices into applications as quickly as possible, while also considering the possible dangers of nanomedicine. The book considers the full range of nanomedicinal applications that employ molecular nanotechnology inside the human body, from the perspective of a future practitioner in an era of widely available nanomedicine. Written by some of the most innovative minds in medicine and engineering, this unique volume will help professionals understand cutting-edge and futuristic areas of research that can have tremendous payoff in terms of improving human health. Readers will find insightful discussions of nanostructured intelligent materials and devices that are considered technically feasible and which have a high potential to produce advances in medicine in the near future. Topics include: Health benefits of phytochemicals and the application of colloidal delivery systems Study of non-covalent attachment of recombinant targeting proteins to polymer-modified Adenoviral gene delivery vectors The role of nanoparticles as adjuvants for mucosal vaccine delivery Poly(amido-amine)s as delivery systems for biologically active substances Antimicrobial activity of silver nanoparticles Nanomedicine in the use of cancer treatment Dendrimers, capsules based on lipid vesicles for drug delivery Many other recent

achievements

Antimicrobial Resistance in Bacteria of Animal Origin comprehensively examines the current research on antimicrobial resistance in the main veterinary and zoonotic pathogens, including resistance to disinfectants and metals used in agriculture.

The two volumes included in Antimicrobial Drug Resistance, Second Edition is an updated, comprehensive and multidisciplinary reference covering the area of antimicrobial drug resistance in bacteria, fungi, viruses, and parasites from basic science, clinical, and epidemiological perspectives. This newly revised compendium reviews the most current research and development on drug resistance while still providing the information in the accessible format of the first edition. The first volume, Antimicrobial Drug Resistance: Mechanisms of Drug Resistance, is dedicated to the biological basis of drug resistance and effective avenues for drug development. With the emergence of more drug-resistant organisms, the approach to dealing with the drug resistance problem must include the research of different aspects of the mechanisms of bacterial resistance and the dissemination of resistance genes as well as research utilizing new genomic information. These approaches will permit the design of novel strategies to develop new antibiotics and preserve the effectiveness of those

currently available. The second volume, Antimicrobial Drug Resistance: Clinical and Epidemiological Aspects, is devoted to the clinical aspects of drug resistance. Although there is evidence that restricted use of a specific antibiotic can be followed by a decrease in drug resistance to that agent, drug resistance control is not easily achieved. Thus, the infectious diseases physician requires input from the clinical microbiologist, antimicrobial stewardship personnel, and infection control specialist to make informed choices for the effective management of various strains of drug-resistant pathogens in individual patients. This 2-volume set is an important reference for students in microbiology, infectious diseases physicians, medical students, basic scientists, drug development researchers, microbiologists, epidemiologists, and public health practitioners.

Drug Efflux Pumps in Cancer Resistance Pathways: From Molecular Recognition and Characterization to Possible Inhibition Strategies in Chemotherapy, Volume Seven, describes the fundamental aspects of efflux pumps of the ATP-binding cassette superfamily in cancer resistance pathways, along with strategies to target and improve chemotherapy efficacy. Pumps of the ATP-binding cassette superfamily (ABCs) regulate the access of drugs to the intracellular space. In this context, the overexpression of ABCs is a well-known mechanism of multidrug

resistance in cancer and is associated with therapeutic failure. Cancer types discussed include breast, endocrine, hematologic, gastrointestinal, musculoskeletal, lung, skin and central nervous system cancers. The book is a valuable source for researchers and advanced students in cancer, biology, pharmacology, pharmaceutical sciences, biomaterials and medical/clinical sciences that are interested in accessing a comprehensive compendium on efflux pumps in mechanisms of cancer resistance. Offers comprehensive and detailed descriptions of the basic aspects of efflux pumps in a very schematic and didactic manner Describes the involvement of efflux pumps in cancer resistance in different cancer types Encompasses an updated overview on state-of-the-art approaches that capitalize on their inhibition to improve chemotherapy and overcome resistance

This book, written by leading international experts, provides a comprehensive, current examination of transport-mediated antimicrobial resistance. As a particularly powerful mechanism of multidrug resistance, an in-depth examination of efflux pumps is conducted with bacteria of major public health concern including Enterobacteriaceae, Acinetobacter, Neisseria, Pseudomonas, staphylococci, and mycobacteria. The content spans structural biochemistry and transport mechanisms of the major transporter families and considers individual

drug efflux systems across various Gram-positive and Gram-negative species. Genomic analysis of efflux pump distribution and their contribution to clinically-relevant resistance are a major focus of the text. Moreover, interplay between drug efflux pumps and other key resistance mechanisms such as intrinsic drug impermeability, inactivation, and target alterations are discussed, as well as their molecular expression-based regulation and physiological functions beyond resistance, involving biofilms, stress response, and pathogenicity. Finally, strategies are addressed to target this drug resistance mechanism with novel antimicrobials or drug inhibitor adjuvants.

ABC Transporters and Cancer provides invaluable information on the exciting and fast-moving field of cancer research. Here, outstanding and original reviews are presented on a variety of topics. This volume covers ABC transporters and cancer, and is suitable for researchers and students alike. Provides information on cancer research Outstanding and original reviews Suitable for researchers and students

This text offers state of the art contributions written by world renown experts which provide an extensive background on specific classes of antibiotics and summarize our understanding as to how these antibiotics might be optimally used in a clinical situation. The book explores pharmacodynamics methods for anti-

infective agents, pharmacodynamics of antibacterial agents and non-antibacterial agents, as well as pharmacodynamic considerations and special populations. As part of the Methods in Pharmacology and Toxicology series, chapters include detailed insight and practical information for the lab. Comprehensive and cutting-edge, Antibiotic Pharmacodynamics serves as an ideal reference for scientists investigating advances in antibiotic pharmacodynamics now finding their way into the antibiotic development process used for licensing new antibiotics.

It is increasingly recognized that various transporter proteins are expressed throughout the body and determine absorption, tissue distribution, biliary and renal elimination of endogenous compounds and drugs and drug effects. This book will give an overview on the transporter families which are most important for drug therapy. Most chapters will focus on one transporter family highlighting tissue expression, substrates, inhibitors, knock-out mouse models and clinical studies.

The ESC Handbook on Cardiovascular Pharmacotherapy, based on the most recent guidelines in cardiovascular pharmacology, and containing a comprehensive A-Z formulary of common and less commonly used cardiac drugs and drug groups, provides practical and accessible guidance on all areas of drugprescribing.Previously published as Drugs in Cardiology, this new edition has been developed by the ESC Working Group on Cardiovascular Pharmacology. Pharmacology is an integral aspect in almost all disciplines within cardiology and all cardiologists use cardiovascular drugs.Completely updated and aligned with the ESC Clinical Practice Guidelines for prescribing, this handbook is essential reading for consultants,

registrars in training, general practitioners, specialist cardiac nurses and cardiovascular pharmacologists.

Drug Targeting and Stimuli Sensitive Drug Delivery Systems covers recent advances in the area of stimuli sensitive drug delivery systems, providing an up-to-date overview of the physical, chemical, biological and multistimuli-responsive nanosystems. In addition, the book presents an analysis of clinical status for different types of nanoplatforms. Written by an internationally diverse group of researchers, it is an important reference resource for both biomaterials scientists and those working in the pharmaceutical industry who are looking to help create more effective drug delivery systems. Shows how the use of nanomaterials can help target a drug to specific tissues and cells Explores the development of stimuli-responsive drug delivery systems Includes case studies to showcase how stimuli responsive nanosystems are used in a variety of therapies, including camptothecin delivery, diabetes and cancer therapy

This book aims to guide and inspire drug researchers as they enter the 21st century.

Stereochemistry is an essential dimension in pharmacology and should be understood as such by all drug researchers whatever their background. When used as probes or medicines, stereoisomeric drugs offer invaluable insights or innovative therapeutic strategies. The book spans the subject from the molecular to the clinical. The first section on chemical aspects contains chapters on chemical synthesis, analysis, natural products, chiral stability (racemization) and physical properties. The second section is on experimental pharmacology, with chapters on drug-receptor interactions, chiral recognition, ion channels, and molecular toxicology. The third section focuses on drug disposition, with chapters on absorption,

Bookmark File PDF Drug Transport In Antimicrobial And Anticancer

distribution, protein binding, metabolism and elimination. The final section is dedicated to regulatory and clinical aspects.

This book is a compilation of past and recent knowledge in the field of emerging drug resistance. The book covers major aspects of drug resistance in bacteria, fungi, malaria, and cancer. Human survival on earth is constantly threatened by disease and syndrome. From the early days, the aim of research in medicine was to find therapeutic agents that can improve the quality of human life. Although humans are dependent on natural compounds from early days their dependence of drugs increased excessively in last century. The advances in chemistry and biology have helped researchers to identify the drugs that have improved treatment of many diseases. The primary factor for treatment of these diseases is dependent on the efficacy of drugs available. The development of resistance to these drugs is one of the major hindrances. Although there are number of books available on this topic, “drug resistance” biology across kingdoms has never been discussed in a coherent way.

Providing contributions drawn from experts specialties of medicine, medical microbiology, pharmacology, therapeutics, medical oncology, infectious disease, biochemistry, molecular biology, and cell biology, this book explores drug transport and its role in resistance in antimicrobial and cancer chemotherapy. The book establishes the biochemical and clinical framework for a diverse audience and focuses specifically on the transport of antibacterial, antifungal/antiparasitic , and anticancer agents. It includes several tables, graphs, and drawings to illustrate appropriate data and convey complex ideas and provides a thorough overview of material not covered in sufficiently in clinical texts.

This book collects reviews and original articles from eminent experts working in the

interdisciplinary arena of nanotechnology use in drug delivery. From their direct and recent experience, the readers can achieve a wide vision on the new and ongoing potentialities of nanotechnology application of drug delivery. Since the advent of analytical techniques and capabilities to measure particle sizes in nanometer ranges, there has been tremendous interest in the use of nanoparticles for more efficient methods of drug delivery. On the other hand, this reference discusses advances in design, optimization, and adaptation of gene delivery systems for the treatment of cancer, cardiovascular, pulmonary, genetic, and infectious diseases, and considers assessment and review procedures involved in the development of gene-based pharmaceuticals.

Volume 19, entitled Essential Metals in Medicine: Therapeutic Use and Toxicity of Metal Ions in the Clinic of the series Metal Ions in Life Sciences centers on the role of metal ions in clinical medicine. Metal ions are tightly regulated in human health: while essential to life, they can be toxic as well. Following an introductory chapter briefly discussing several important metal-related drugs and diseases and a chapter about drug development, the focus is first on iron: its essentiality for pathogens and humans as well as its toxicity. Chelation therapy is addressed in the context of thalassemia, its relationship to neurodegenerative diseases and also the risks connected with iron administration are pointed out. A subject of intense debate is the essentiality of chromium and vanadium. For example, chromium(III) compounds are taken as a nutritional supplement by athletes and bodybuilders; in contrast, chromate, Cr(VI), is toxic and a carcinogen for humans. The beneficial and toxic effects of manganese, cobalt, and copper on humans are discussed. The need for antiparasitic agents is emphasized as well as the clinical aspects of metal-containing antidotes for cyanide poisoning. In addition to the essential

and possibly essential ones, also other metal ions play important roles in human health, causing harm (like the metalloids 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. This book provides with a comprehensive overview of the role of drug transporters in drug disposition and efficacy/toxicity, as well as drug-drug interactions and recent advances in the field. Transporters are known determinants of drug disposition and efficacy/toxicity. In general, they are divided into solute carrier (SLC) and ATP binding cassette (ABC) families, and are located along cell membranes, where they mediate drug uptake into cells and export out of cells. Drug transporters are essential in maintaining cell homeostasis, and their gene mutations may cause or contribute to severe human genetic disorders, such as cystic fibrosis, neurological disease, retinal degeneration, anemia, and cholesterol and bile transport defects. Conversely, some diseases may also alter transporter functions and expressions, in turn aggravating disease process. Further, since over-expression of some ABC transporters is a

potential contributor to multidrug-resistance (MDR), the book presents a number of strategies to overcome MDR, including ABC transporter inhibitors and applying epigenetic methods to modulate transporter expressions and functions. This book is useful for graduate students and professionals who are looking to refresh or expand their knowledge of this exciting field.

Leading experts summarize and synthesize the latest discoveries concerning the changes that occur in tumor cells as they develop resistance to anticancer drugs, and suggest new approaches to preventing and overcoming it. The authors review physiological resistance based upon tumor architecture, cellular resistance based on drug transport, epigenetic changes that neutralize or bypass drug cytotoxicity, and genetic changes that alter drug target molecules by decreasing or eliminating drug binding and efficacy. Highlights include new insights into resistance to antiangiogenic therapies, oncogenes and tumor suppressor genes in therapeutic resistance, cancer stem cells, and the development of more effective therapies. There are also new findings on tumor immune escape mechanisms, gene amplification in drug resistance, the molecular determinants of multidrug resistance, and resistance to taxanes and Herceptin.

Nano- and Microscale Drug Delivery Systems: Design and Fabrication presents the developments that have taken place in recent years in the field of micro- and nanoscale drug delivery systems. Particular attention is assigned to the fabrication and design of

drug delivery systems in order to i) reduce the side effects of therapeutic agents, ii) increase their pharmacological effect, and iii) improve aqueous solubility and chemical stability of different therapeutic agents. This book is designed to offer a cogent, concise overview of current scholarship in this important area of research through its focus on the characterization and fabrication of a variety of nanomaterials for drug delivery applications. It is an invaluable reference source for both biomaterials scientists and biomedical engineers who want to learn more about how nanomaterials are engineered and used in the design of drug delivery nanosystems. Shows how micro- and nanomaterials can be engineered to create more effective drug delivery systems Summarizes current nanotechnology research in the field of drug delivery systems Explores the pros and cons of using particular nanomaterials as therapeutic agents Serves as a valuable reference for both biomaterials scientists and biomedical engineers who want to learn more about how nanomaterials are engineered and used in the design of drug delivery nanosystems

Nanomaterials for Drug Delivery and Therapy presents recent advances in the field of nanobiomaterials and their important applications in drug delivery, therapy and engineering. The book offers pharmaceutical perspectives, exploring the development of nanobiomaterials and their interaction with the human body. Chapters show how nanomaterials are used in treatments, including neurology, dentistry and cancer therapy. Authored by a range of contributors from global institutions, this book offers a

broad, international perspective on how nanotechnology-based advances are leading to novel drug delivery and treatment solutions. It is a valuable research resource that will help both practicing medics and researchers in pharmaceutical science and nanomedicine learn more on how nanotechnology is improving treatments. Assesses the opportunities and challenges of nanotechnology-based drug delivery systems
Explores how nanotechnology is being used to create more efficient drug delivery systems
Discusses which nanomaterials make the best drug carriers

Years of using, misusing, and overusing antibiotics and other antimicrobial drugs has led to the emergence of multidrug-resistant 'superbugs.' The IOM's Forum on Microbial Threats held a public workshop April 6-7 to discuss the nature and sources of drug-resistant pathogens, the implications for global health, and the strategies to lessen the current and future impact of these superbugs.

In order to avoid late-stage drug failure due to factors such as undesirable metabolic instability, toxic metabolites, drug-drug interactions, and polymorphic metabolism, an enormous amount of effort has been expended by both the pharmaceutical industry and academia towards developing more powerful techniques and screening assays to identify the metabolic profiles and enzymes involved in drug metabolism. This book presents some in-depth reviews of selected topics in drug metabolism. Among the key topics covered are: the interplay between drug transport and metabolism in oral bioavailability; the influence of genetic and epigenetic factors on drug metabolism;

impact of disease on transport and metabolism; and the use of novel microdosing techniques and novel LC/MS and genomic technologies to predict the metabolic parameters and profiles of potential new drug candidates.

This monograph is a collection of reviews that presents results obtained from new and somewhat unconventional methods used to fight multiple drug resistance (MDR) acquired by microorganisms and tumours. Two directions are considered: (i) the modification of non-antibiotic medicines by exposure to un-coherent, or laser optical radiation to obtain photoproducts that receive bactericidal or, possibly, tumouricidal properties and (ii) the development of new vectors (micrometric droplets of solutions containing medicinal agents) to transport medicines to targets based on optical and micro spectroscopic methods. Chapters shed light on pendant droplets used for antibiotic drug delivery, the science of lasers and their interactions with fluids in pendant droplets and spectroscopic analyses of droplets used to treat MDR infections. It therefore equips researchers and medical professionals with information about tools that enable them to respond to medical emergencies in challenging environments. The intended readership for this monograph includes graduate students, medical doctors, fluid physicists, biologists, photochemists, and experts in drug delivery methods employed in extreme conditions (such as those found in outer space and hypergravity conditions) who are learning about using techniques such as laser spectroscopy, biophotonics and optofluidics/microfluidics.

The concept of focal controlled drug delivery has been applied for treating illnesses that are localized to a certain tissue or organ. These delivery systems are applied directly to the diseased site and deliver a desired dose for an extended time period while minimizing systemic distribution of toxic drug. Controlled drug delivery systems have been focused on oral extended release formulations and on systemic delivery of small drugs and peptides. Despite the upsurge of interest in focal targeted drug delivery, there is currently no single reference text on the subject. By comparison, there are numerous authored and edited books on oral, systemic and transdermal drug delivery or books on biodegradable polymers as drug carriers. Thus, the aim of Focal Drug Delivery is to bring together leading experts and researchers in the field to provide an authoritative account of the essential pharmaceutical, technological, physiological and biological sciences underpinning the topic. In addition, the book will review advances in treatment options for diseases localized at a certain tissue or organ.

ABC Proteins is an in-depth, up-to-date analysis of all that is known about the subject to date. It discusses and compares evolution, biology and mechanism of action of all known ABC proteins, including the first structural studies as well as clinical implications. It will be useful to anyone trying to stay abreast of the latest findings. This book is sure to become a classic and will regularly be updated.

Phylogeny and Evolution of ABC Transporters
Fundamental Aspects of the Mechanism of Action of ABC Transporters
Prokaryote ABC Transporters
Non-

Mammalian Transporters Multidrug Transporters ABC Transporters, Physiological Roles and Human Disease Full color throughout

Recent years have seen a resurgence of antibiotic drug discovery. This book brings together the relevant information to assess the state-of-the-art. It identifies and elaborates the most recent and compelling strategies for antibiotic drug discovery with a primary focus on new targets, mechanisms and molecular entities. Addressing the need for continued investment in antibiotic drug development, the book provides a point of reference for the rapidly expanding infectious disease research community. In addition to its attention on new targets, the book focusses on the medicinal chemistry and chemistry of the targets. Within this framework, chapters from leading researchers in academia and industry address findings in important areas such as biofilm production, narrow spectrum antibiotics and novel antibacterials from previously uncultured soil bacteria. This book will be a useful resource for postgraduate students and researchers in medicinal chemistry wishing to understand the latest approaches to antibiotic drug discovery.

This book presents a thorough and authoritative overview of the multifaceted field of antibiotic science – offering guidance to translate research into tools for prevention, diagnosis, and treatment of infectious diseases. Provides readers

with knowledge about the broad field of drug resistance Offers guidance to translate research into tools for prevention, diagnosis, and treatment of infectious diseases Links strategies to analyze microbes to the development of new drugs, socioeconomic impacts to therapeutic strategies, and public policies to antibiotic-resistance-prevention strategies

The increased understanding of molecular aspects associated with chronic diseases, such as cancer and the role of tumor microenvironment, has led to the identification of endogenous and exogenous stimuli that can be exploited to devise “stimuli-responsive” materials for site-specific drug delivery applications. This book provides a comprehensive account on the design, materials chemistry, and application aspects behind these novel stimuli-responsive materials. Setting the scene, the editors open with a chapter addressing the need for smart materials in delivery applications for therapy, imaging and disease diagnosis. The following chapter describes the key physical and chemical aspects of smart materials, from lipids to polymers to hybrid materials, providing the reader with a springboard to delve into the more application oriented chapters that follow. With in-depth coverage of key drug delivery systems such as pH-responsive, temperature responsive, enzyme-responsive and light responsive systems, this book provides a rigorous foundation to the field. A perfect resource for graduate

students and newcomers, the closing chapter on regulatory and commercialization challenges also makes the book ideal for those wanting to take the next step towards clinical translation.

This first edition of Antimicrobial Drug Resistance grew out of a desire by the editors and authors to have a comprehensive resource of information on antimicrobial drug resistance that encompassed the current information available for bacteria, fungi, protozoa and viruses. We believe that this information will be of value to clinicians, epidemiologists, microbiologists, virologists, parasitologists, public health authorities, medical students and fellows in training. We have endeavored to provide this information in a style which would be accessible to the broad community of persons who are concerned with the impact of drug resistance in our clinics and across the broader global communities. Antimicrobial Drug Resistance is divided into Volume 1 which has sections covering a general overview of drug resistance and mechanisms of drug resistance first for classes of drugs and then by individual microbial agents including bacteria, fungi, protozoa and viruses. Volume 2 addresses clinical, epidemiologic and public health aspects of drug resistance along with an overview of the conduct and interpretation of specific drug resistance assays. Together, these two volumes offer a comprehensive source of information on drug resistance issues by the

experts in each topic.

ATP Binding Cassette (ABC) transporters are a family of integral membrane proteins that are likely to be represented in all the cells of all species of archaea, eubacteria and eukaryota. The vast majority of these proteins control the transport of molecules (from small hydrophilic ions to lipids and proteins) across cellular membranes. The human genome encodes 48 ABC transporters and most have been shown to underlie one or more human diseases. This book that brings together state-of-the-art knowledge on proteins in one volume will provide students, professors and medical professionals with a background to the human ABC transporters that are known to be relevant to diseases. Each of the 14 chapters is written by a leading researcher in the field and includes contributions from Joe Bryan and Lydia Aguilar-Bryan, Kazu Ueda, Jack Riordan and Robert Tamp. The genetics, structure and function of the proteins, and the future direction of research including the implications for human health are discussed in depth.

Antimicrobial Nanoarchitectonics: From Synthesis to Applications brings together recent research in antimicrobial nanoparticles, specifically in the sustained and controlled delivery of antimicrobials. Particular attention is given to i) reducing the side effects of antibiotics, ii) increasing the pharmacological effect, and iii)

improving aqueous solubility and chemical stability of different antimicrobials. In addition, antimicrobial nanoparticles in drug delivery are discussed extensively. The book also evaluates the pros and cons of using nanostructured biomaterials in the prevention and eradication of infections. It is an important reference resource for materials scientists and bioengineers who want to learn how nanomaterials are used in antimicrobial therapy. Provides readers with the information necessary to select the appropriate bionanomaterial to solve particular infection problems Includes case studies, showing how particular bionanomaterials have been used to cure infections Explains the central role that nanotechnology plays in modern antimicrobial therapy Evaluates the pros and cons of using nanostructured biomaterials in the prevention and eradication of infections

Technological Challenges in Antibiotic Discovery and Development is the summary of a workshop convened by the Chemical Sciences Roundtable in September 2013 to explore the current state of antibiotic discovery and examine the technology available to facilitate development. Through formal presentations and panel discussions, participants from academia, industry, federal research agencies discussed the technical challenges present and the incentives and disincentives industry faces in antibiotic development, and identified novel

approaches to antibiotic discovery. Antibiotic resistance is a serious and growing problem in modern medicine and it is emerging as a pre-eminent public health threat. Each year in the United States alone, at least two million acquire serious infections with bacteria that are resistant to one or more antibiotics, and at least 23,000 people die annually as a direct result of these antibiotic-resistant infections. In addition to the toll on human life, antibiotic-resistant infections add considerable and avoidable costs to the already overburdened U.S. health care system. This report explores the challenges in overcoming antibiotic resistance, screening for new antibiotics, and delivering them to the sites of infection in the body. The report also discusses a path forward to develop the next generation of potent antimicrobial compounds capable of once again tilting the battle against microbial pathogens in favor of humans. *Technological Challenges in Antibiotic Discovery and Development* gives a broad view of the landscape of antibiotic development and the technological challenges and barriers to be overcome. The subject is one of major interest in basic microbiology and infectious diseases and the book is a known classic.

The rapid advances made in the study of the synthesis, structure and function of biological macromolecules in the last fifteen years have enabled scientists concerned with antimicrobial agents to achieve a considerable measure of understanding of how these substances inhibit

cell growth and division. The use of antimicrobial agents as highly specific inhibitors has in turn substantially assisted the investigation of complex biochemical processes. The literature in this field is so extensive however, that we considered an attempt should be made to draw together in an introductory book the more significant studies of recent years. This book, which is in fact based on lecture courses given by us to undergraduates at Liverpool and Manchester Universities, is therefore intended as an introduction to the biochemistry of antimicrobial action for advanced students in many disciplines. We hope that it may also be useful to established scientists who are new to this area of research. The book is concerned with a discussion of medically important antimicrobial compounds and also a number of agents that, although having no medical uses, have proved invaluable as research tools in biochemistry. Our aim has been to present the available information in a simple and readable way, emphasizing the established facts rather than more controversial material. Whenever possible, however, we have indicated the gaps in the present knowledge of the subject where further information is required.

This reference handbook is the first to provide a comprehensive overview, systematically characterizing all known transporters involved in drug elimination and resistance. Combining recent knowledge on all known classes of drug carriers, from microbes to man, it begins with a look at human and mammalian transporters. This is followed by microbial, fungal and parasitic transporters with special attention given to transport across those physiological barriers relevant for drug uptake, distribution and excretion. As a result, this key resource lays the foundations for understanding and investigating the molecular mechanisms for multidrug resistance in cancer cells, microbial resistance to antibiotics and pharmacokinetics in general.

Bookmark File PDF Drug Transport In Antimicrobial And Anticancer

For anyone working with antibiotics and cancer chemotherapeutics, as well as being of prime interest to biochemists and biophysicists.

A comprehensive review of the most current scientific research on ABC transporters and multidrug resistance ATP-binding cassette transporter genes (ABC transporters) are known to play a crucial role in the development of multidrug resistance (MDR). MDR is the ability of pathologic cells, such as tumors, to withstand chemicals designed to target and destroy such cells. In MDR, patients who are on medication eventually develop resistance to not only the drug they are taking, but to several different types of drugs. ABC Transporters and Multidrug Resistance offers an essential resource for pharmaceutical researchers who are working to discover drugs to counteract multidrug resistance in diseases such as cancer. In one comprehensive volume, this book contains a collection of the most current knowledge on the involvement of ABC transporters in drug transport and resistance. This comprehensive volume provides an overview on the description of the structure, the genome, normal tissue expression, physiological aspect, and mechanism of action of the ABC protein. The expert contributors explore the expression, detection, and implications of ABC proteins in hematological malignancies and solid tumors and ABC proteins and pathogenic microorganisms. This volume also explains MDR modulation through inhibition of ABC transporters and the design of inhibitors and mechanism of action. In addition, the book offers essential information on the biological and clinical aspect of multidrug resistance.

An overview of current research and developments in ultrasensitive bioanalysis New platforms of ultrasensitive analysis of biomolecules and single living cells using multiplexing, single nanoparticle sensing, nano-fluidics, and single-molecule detection are advancing every

Bookmark File PDF Drug Transport In Antimicrobial And Anticancer

scientific discipline at an unprecedented pace. With chapters written by a diverse group of scientists working in the forefront of ultrasensitive bioanalysis, this book provides an overview of the current status and an in-depth understanding of the objectives and future research directions of ultrasensitive bioanalysis. Spanning a wide spectrum of new research approaches, this book: Introduces new theories, ideas, methodologies, technologies, and applications of ultrasensitive bioanalysis in a wide variety of research fields Includes background, fundamentals, and descriptions of instrumentation and techniques behind every experimental design and approach to help readers explore the promising applications of new tools Covers single molecule detection (SMD), single living cell analysis, multi-functional nanoparticle probes, miniaturization, multiplexing, quantitative and qualitative analysis of metal ions and small molecules, and more Discusses techniques such as single molecule microscope and spectroscopy, single nanoparticle optics, single nanoparticle sensors, micro- and nano-fluidics, microarray detection, ultramicroelectrodes, electrochemiluminescence, mass spectrometry, and more This book will be a useful resource and an inspiration for scientists and graduate and undergraduate students in a wide variety of research fields, including chemistry, biology, biomedical science and engineering, and materials science and engineering.

Focuses on combating bacterial pathogens by understanding their strategies of defense! Each chapter begins with a summary of concepts, so those not actively working in the field gain an overall picture of what follows! Highlights antibiotic resistance in pathogens that poses the greatest threat to human health! Containing nearly 2000 references for additional research, Bacterial Resistance to Antimicrobials discusses the ecology of drug resistance genes,

Bookmark File PDF Drug Transport In Antimicrobial And Anticancer

acquired response, and selection in natural bacterial populations describes global response systems that are a basis of resistance details antibiotic modification, inactivation, and host target modification as means of resistance development considers efflux mechanisms, one of the major causes of multidrug resistance covers concepts for developing therapies against multidrug resistant organisms emphasizes the structural basis of lactamases and other enzymes involved in inactivation of antibiotics surveys the epidemiology of methicillin resistance among nosocomial isolates and community-acquired strains outlines molecular detection methods for mainstream diagnostic tests assesses the promise of modern genomics to identify novel targets for drug discovery screening Presenting the molecular basis, methods of detection and identification, and concepts for reducing the development and spread of resistant bacterial strains, *Bacterial Resistance to Antimicrobials* is an excellent reference for microbiologists, pharmacists, public health officials, infectious disease specialists, organic and medicinal chemists, and upper-level undergraduate and graduate students in these disciplines. [Copyright: 3a9ecc635c2729a67ab492f5456113c3](#)