



Antiviral Drug Resistance

Erik De Clercq



Antiviral Drug Resistance:

Antimicrobial Drug Resistance Douglas Mayers, 2009-07-06 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

Antiviral Drug Resistance Douglas D. Richman, 1996-12-02 The study of antiviral drug resistance has provided important insights into the structure of virus enzymes the functions of certain genes mechanisms of action of antiviral drugs the design of new antiviral compounds and the pathogenesis of viral diseases The emergence of resistant strains must be explored at all stages of drug development during the preclinical evaluation of candidate compounds during the early clinical evaluation of new drugs and as part of epidemiological surveillance for the prevalence of resistance during use of approved treatments Accumulating understanding of antiviral drug resistance thus reflects progress in the chemotherapy of viral infection Antiviral Drug Resistance provides state of the art coverage of the basic and clinical aspects of this subject It deals with the basic science including the mechanisms of drug resistance and drug action genetics of drug resistance cross resistance and X ray crystallographic structural aspects of resistance as well as the clinical aspects including issues of assay of susceptibility of clinical isolates descriptive aspects of emergence of reduced susceptibility and clinical significance and impact of resistance As such this unique volume will be essential to basic researchers in drug discovery and viral pathogenesis as well as clinicians involved in antiviral chemotherapy

Biochemistry of Drug Resistance Sarfraz Ahmed, Suvash Chandra Ojha, Muhammad Najam-ul-Haq, Muhammad Younus, Muhammad Zaffar Hashmi, 2021-08-05 This book provides a comprehensive discussion on the current information and evidence on the latest developments in the field of drugs resistance Drug resistance is the reduction in effectiveness of a medication such as an antimicrobial or an antineoplastic in treating a disease or condition This leads to negative outcomes at great risk of public health therefore increasing efforts are dedicated to the development of a new generation of medications that will help deal with this phenomenon Decades of technological innovations in drug design have demonstrated the potential of resistance Enormous information on various aspects of

antibiotics resistance is available However literature on drug resistance specifically related to infectious and non infectious diseases is rarely presented particularly those focusing on the mechanisms biochemistry kinetics dynamics and management of drug resistance Therefore there is an immense need for a systematic compilation on the available information about this issue All the chapters are logically selected and arranged to provide state of the art information about all aspects of drugs resistance After an introductory chapter four chapters are dedicated to infectious microbial diseases whereas two other chapters are complimenting this theme and focusing on drugs resistance in ear nose and throat and skin diseases The recent advances in the understanding of drugs resistance in lung neurological kidney heart and liver diseases are also covered Biochemistry of drugs resistance in cancer HIV ocular reproductive and diabetes diseases is also discussed Finally a chapter dedicated to the management of drug resistance has been included

Antimicrobial Drug Resistance Douglas L. Mayers, Jack D. Sobel, Marc Ouellette, Keith S. Kaye, Dror Marchaim, 2017-06-19 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

Antiviral Drug Development Erik De Clercq, Richard T. Walker, 2012-12-06

Clinical Use of Antiviral Drugs Erik de Clercq, 2012-12-06 Antiviral chemotherapy has come of age and after an initial slow progress the development of new antiviral agents has proceeded at a more rapid pace and the perspectives for their clinical use have increased considerably Now 25 years after the first antiviral assay idoxuridine was introduced in the clinic it is fitting to commemorate the beginning of the antivirals era In its introductory chapter B E Juel

Jensen touches on what may be considered as five of the most fundamental requirements of an antiviral drug efficacy relative non toxicity easy solubility ready availability and reasonable cost Surely the antiviral drugs that have so far been used in the clinic could still be improved upon as one or more of these five essential demands are concerned How is all began is narrated by W H Prusoff The first antiviral drugs to be used in humans were methisazone and idoxuridine the former which is now of archival interest in the prevention of smallpox the latter which was approved for clinical use in the United States in 1962 for the topical treatment of herpetic keratitis In terms of potency also because of solubility reasons idoxuridine has been superseded by trifluridine in the topical treatment of herpes simplex epithelial keratitis H E Kaufman did not find trifluridine or acyclovir effective in the treatment of deep stromal keratitis or iritis and he reckons that other antiviral drugs like bromovinyldeoxyuridine would not be effective either Antimicrobial Drug Resistance L Bryan,2012-12-02

Antimicrobial Drug Resistance presents information regarding the ability of organisms to resist natural and synthetically derived inhibitors It presents the view of the authors who made significant contributions to the understanding of resistance The book focuses on inhibitors classified as antifungal antiviral and antimalarial as well as metal ions It also covers numerous reactions which have been genetically and biochemically analyzed in this context Additionally some chapters cover resistance plasmids of most of the clinically important bacteria The book is designed to aid those involved in microbiological and pharmaceutical research on antimicrobial agents clinical infectious diseases and medical microbiology teaching microbiology and pharmacology pharmaceutical marketing and infection control Fields' Virology David Mahan Knipe,Peter M.

Howley,2007 Accompanying CD ROM has same title as book **Antimicrobial Resistance in the 21st Century** I. W. Fong,David Shlaes,Karl Drlica,2018-11-10 This comprehensive up to date volume defines the issues and offers potential solutions to the challenges of antimicrobial resistance The chapter authors are leading international experts on antimicrobial resistance among a variety of bacteria viruses including HIV and herpes parasites and fungi The chapters explore the molecular mechanisms of drug resistance the immunology and epidemiology of resistance strains clinical implications and implications on research and lack thereof and prevention and future directions Antiviral Drugs Wieslaw M.

Kazmierski,2011-08-23 This book focuses on new small molecule approaches to combat viral infections The chapters describe the discovery and development from bench through the clinic of relatively recently approved antiviral drugs and compounds in advanced clinical development Organized by a virus such as HIV HCV RSV influenza HBV and CMV and written by top academic and industrial authorities in the field the book provides a unique opportunity to study understand and apply discovery and development principles and learning without the need for an individual to research analyze and synthesize all immense sourcing references Topics showcase challenges and solutions of issues encountered offering tremendous experience accumulated over many years of research that will be particularly useful to basic and bench scientists as well as clinicians as they continue discovering and developing new drugs and therapies **Handbook of Research on**

Nano-Strategies for Combatting Antimicrobial Resistance and Cancer Saravanan, Muthupandian, Gopinath, Venkatraman, Deekonda, Karthik, 2021-02-12 Multidrug resistant bacteria play a significant role in public health by destroying the potency of existing antibiotics. Meanwhile, cancer remains one of the most common health problems that impact society, resulting in many deaths worldwide. Novel strategies are required to combat antimicrobial resistance and create efficient anticancer drugs that could revolutionize treatment. Nanomedicine is one such innovation that plays a significant role in developing alternative and more effective treatment strategies for antimicrobial resistance and cancer theranostics. The Handbook of Research on Nano Strategies for Combatting Antimicrobial Resistance and Cancer is an essential scholarly resource that examines 1 how to overcome the existing traditional approaches to combat antimicrobial resistance and cancer, 2 how to apply multiple mechanisms to target the cancer cells and microbes, and 3 how the nanomaterials can be used as carriers. Featuring a range of topics such as bacteriophage nanomedicine and oncology, this book is ideal for molecular biologists, microbiologists, nanotechnologists, academicians, chemists, pharmacists, oncologists, researchers, healthcare professionals, and students.

Targets for the Design of Antiviral Agents Erik De Clercq, 2013-06-29 This publication contains the Review Lectures presented at a joint NATO Advanced Study Institute and FEES Advanced Study Course held at Les Arcs Bourg Saint Maurice, France, from the 19th June to 2nd July 1983. The Course entitled Targets for the Design of Antiviral Agents was in some ways a sequel to the NATO FEES Course held at SOGESTA near Urbino, Italy, from the 7th to 18th May 1979 and published as volume A26 in this series. During the subsequent four years, we have witnessed the first of the new generation of antiviral compounds which are more efficacious and less toxic than the classical antiviral drugs reach the clinic, and we felt that it was the right time to assess the future prospects of this very important and exciting field. The vast majority of the drugs developed recently have proved active against various members of the herpesvirus family, and elsewhere in this publication we learn that the cure for only a rather few viral diseases such as the common cold, influenza, and herpes promises the return on investment required by the pharmaceutical industry. However, the aim of this Course was for eminent virologists to identify possible targets among the various virus classes against which the chemists could then design suitable therapeutic agents. Recent advances with antiherpesvirus drugs have shown that a far greater selectivity and therapeutic index can be obtained than was previously thought to be possible.

Antiviral Drug Discovery and Development Xinyong Liu, Peng Zhan, Luis Menéndez-Arias, Vasanthanathan Poongavanam, 2021-07-13 This book summarizes the state of the art antiviral drug design and discovery approaches starting from natural products to de novo design and provides a timely update on recently approved antiviral drugs and compounds in advanced clinical development. Special attention is paid to viral infections with a high impact on the world population or highly relevant from the public health perspective: HIV, hepatitis C, influenza virus, etc. In these chapters, limitations associated with adverse effects and emergence of drug resistance are discussed in detail. In addition to classical antiviral strategies, chapters will be dedicated to discuss the non-classical drug

development strategies to block viral infection for instance allosteric inhibitors covalent antiviral agents or antiviral compounds targeting protein protein interactions Finally current prospects for producing broad spectrum antiviral inhibitors will be also addressed The book is distinctive in providing the most recent update in the rapidly evolving field of antiviral therapeutics Authoritative reviews are written by international scientists well known for their contributions in their topics of research which makes this book suitable for researchers not only within the antiviral research community but also attractive to a broad audience in the drug discovery field This book covers molecular structures and biochemical mechanisms mediating the antiviral effects while discussing various ligand design strategies which include traditional medicinal chemistry computational chemistry and chemical biology approaches The book provides a comprehensive review of antiviral drug discovery and development approaches particularly focusing on current innovations and future trends

Successful Strategies for the Discovery of Antiviral Drugs Manoj C. Desai, Nicholas A. Meanwell, 2013 This volume will be aimed at medicinal chemistry and emerging drug discovery scientists

Viral Drug Delivery Systems Ranjita Shegokar, Yashwant Pathak, 2023-04-10 The disability adjusted life year DALY is a generic measure of health effect that can be used in cost effectiveness analysis as an alternative to the quality adjusted life year QALY Infectious diseases are one of the major to cause significant losses of DALY and QALY Human infectious diseases are disorders that are triggered by the micro organisms such as bacteria fungi viruses or parasites The majority of such diseases are contagious and create a public health menace There are several reasons why infectious diseases are deadly diseases and one of the primary reasons is the drug resistance developed over time Drug resistance associated mutations are linked to increasing drug efflux modifications of the drugs or their targets Every year new drugs are being approved by FDA to treat infectious diseases Nonetheless the infectious diseases will undoubtedly persist as permanent and main threats to humanity for now and in the future primarily due to increased longevity that almost always comes at a cost of impaired immunity A total of four books are covered under the series of Infectious drug diseases Malarial drug delivery systems Tubercular drug delivery systems Viral drug delivery systems Infectious disease drug delivery systems The third volume of series is focused on viral drug delivery systems Typically virus attaches to the cells referred as host cell and releases its DNA or RNA inside the cell In second stage virus s genetic material takes control of the cell and forces it to replicate the virus leading to onset of disease symptoms DNA class of viruses include Herpes Papilloma and Adeno viruses RNA class of viruses include retroviruses such as HIV immunodeficiency virus and SARS COV 2 Corona virus This book addresses recent developments in viral drug delivery systems It covers many different aspects of viral infections ways to treat them using modern drug delivery systems like nano particulate carriers The choice of viral delivery systems mainly depends upon the type of virus duration of life cycle presence of drug resistance cellular and mucosal interaction of virus accordingly gene or non gene drug delivery systems are selected Besides that this book also reports global dynamics of viral diseases future predictions of infection rate current treatment

options details of drug carriers like nanoemulsions polymeric nanoparticles role of biofunctionalization and phyto molecules in treatment of viral infections particularly herpes Covid 19 Ebola HIV AIDS influenza and viral hepatitis Audiences from a broad range of groups from researchers academicians and public health bodies to regulatory experts can benefit from the compiled information to learn more about patient needs and current research advances in the field of viral drug delivery research

AIDS Hung Fan, Ross Conner, Luis Villarreal, 2011-01-28 AIDS Science and Society Sixth Edition provides readers with the most current information available on the biology of the virus and the impact it has on society The Sixth Edition of this best selling text provides readers with a solid overview of AIDS from both a biomedical and a psychosocial perspective The authors cover the molecular and cellular aspects of the virus and the immune system's response to it and examine epidemiology and its role in understanding HIV and AIDS The use of understandable vocabulary and clear illustrations along with updated biomedical data and the most current statistics on AIDS available makes AIDS Science and Society an essential resource for students researchers and general readers

Antimicrobial Resistance and Implications for the 21st Century I.W. Fong, Karl Drlica, 2007-11-15 Antimicrobial resistance can develop in any type of microbe germ Microbes can develop resistance to specific medicines A common misconception is that a person's body becomes resistant to specific drugs However it is microbes not people that become resistant to the drugs Drug resistance happens when microbes develop ways to survive the use of medicines meant to kill or weaken them If a microbe is resistant to many drugs treating the infections it causes can become difficult or even impossible Someone with an infection that is resistant to a certain medicine can pass that resistant infection to another person In this way a hard to treat illness can be spread from person to person In some cases the illness can lead to serious disability or even death This comprehensive up to date volume aims to define issues and potential solutions to the challenges of antimicrobial resistance The chapter authors are leading international experts on antimicrobial resistance among a variety of bacteria Streptococcus pneumoniae enterococci staphylococci gram negative bacilli mycobacteria species viruses HIV herpesviruses and fungi Candida species fusarium etc The chapters will explore the molecular mechanisms of drug resistance the immunology and epidemiology of resistance strains clinical implications and implications on research and lack thereof and prevention and future directions This volume will also describe the steps that researchers are taking to develop molecular methods for detecting resistance develop drugs and other means to deal with newly resistant organisms A special chapter to address the issues on strategies to limit antimicrobial resistance propagation will be included in this volume

Artificial Intelligence and Machine Learning in Drug Design and Development Abhirup Khanna, May El Barachi, Sapna Jain, Manoj Kumar, Anand Nayyar, 2024-07-18 The book is a comprehensive guide that explores the use of artificial intelligence and machine learning in drug discovery and development covering a range of topics including the use of molecular modeling docking identifying targets selecting compounds and optimizing drugs The intersection of Artificial Intelligence AI and Machine Learning ML within the field of

drug design and development represents a pivotal moment in the history of healthcare and pharmaceuticals. The remarkable synergy between cutting edge technology and the life sciences has ushered in a new era of possibilities offering unprecedented opportunities, formidable challenges and a tantalizing glimpse into the future of medicine. AI can be applied to all the key areas of the pharmaceutical industry such as drug discovery and development, drug repurposing and improving productivity within a short period. Contemporary methods have shown promising results in facilitating the discovery of drugs to target different diseases. Moreover, AI helps in predicting the efficacy and safety of molecules and gives researchers a much broader chemical palette for the selection of the best molecules for drug testing and delivery. In this context, drug repurposing is another important topic where AI can have a substantial impact. With the vast amount of clinical and pharmaceutical data available to date, AI algorithms find suitable drugs that can be repurposed for alternative use in medicine. This book is a comprehensive exploration of this dynamic and rapidly evolving field. In an era where precision and efficiency are paramount in drug discovery, AI and ML have emerged as transformative tools reshaping the way we identify, design and develop pharmaceuticals. This book is a testament to the profound impact these technologies have had and will continue to have on the pharmaceutical industry, healthcare and ultimately patient well-being. The editors of this volume have assembled a distinguished group of experts, researchers and thought leaders from both the AI, ML and pharmaceutical domains. Their collective knowledge and insights illuminate the multifaceted landscape of AI and ML in drug design and development, offering a roadmap for navigating its complexities and harnessing its potential. In each section, readers will find a rich tapestry of knowledge, case studies and expert opinions providing a 360 degree view of AI and ML's role in drug design and development. Whether you are a researcher, scientist, industry professional, policymaker or simply curious about the future of medicine, this book offers 19 state-of-the-art chapters providing valuable insights and a compass to navigate the exciting journey ahead.

Audience: The book is a valuable resource for a wide range of professionals in the pharmaceutical and allied industries, including researchers, scientists, engineers and laboratory workers in the field of drug discovery and development who want to learn about the latest techniques in machine learning and AI as well as information technology professionals who are interested in the application of machine learning and artificial intelligence in drug development.

Pathogenicity and Drug Resistance of Human Pathogens Saif Hameed, Zeeshan Fatima, 2020-01-23. The book comprehensively discusses the mechanisms of pathogenesis and drug resistance, current diagnostics, landscape of four key human pathogens: bacterial, fungal, protozoans and viral, which are the causes of major infectious diseases. It also assesses the emerging technologies for the detection and quantification of these pathogens. Further, it discusses the novel opportunities to fight against these infectious diseases and to identify pertinent drug targets with novel methodologies. It also reviews the current and future insights into the control, elimination and eradication of these infectious diseases. Importantly, the book discusses the epidemiological characteristics and various challenges in combating Ebola and Influenza diseases. Finally, the

book highlights the growing role of nanotechnology and bioinformatics resources for combating the infectious diseases In summary the book provides the mechanistic insight of the pathogenicity drug resistance therapeutic strategies and identification of the novel drug targets of Mycobacterium tuberculosis Plasmodium Candida Hepatitis C and emerging viral infections

Non-traditional Approaches to Combat Antimicrobial Drug Resistance Mohmmad Younus Wani,Aijaz Ahmad,2023-02-13 This book provides a detailed overview of the progress and challenges of non traditional approaches for tackling antimicrobial resistance The first chapter covers the factors that make microbes more likely to develop multidrug resistance The book goes on to discuss the antimicrobial properties of propolis essential oils and other microbial constituents that are used or under investigation to treat multidrug resistant infections Additionally it covers alternative compounds that work as antimicrobial agents their mechanisms of action and how they might be utilized in conjunction with conventional drugs to circumvent drug resistance The book explores the application of phage therapy and recent advancements in phage based infection control with an emphasis on multidrug resistant infections and discusses drug repurposing as a strategy to develop new antimicrobial agents efficiently and expeditiously Additionally it discusses the uses of nanoparticles in the treatment of infections brought on by multidrug resistant pathogens and examines the use of different nanotechnology based approaches to fudge microbial resistance mechanisms It concludes by reviewing recent studies on microbial quorum sensing systems and focuses on the significance of quorum sensing systems in controlling microbial resistance mechanisms and at the same time highlights the importance and role of antimicrobial stewardship program to fight microbial infections The book is an invaluable source of knowledge and information for academics basic and clinical researchers clinicians and paramedic staff involved in one way or the other in the development and use of antimicrobial agents and strategies to combat multidrug resistance

Fuel your quest for knowledge with is thought-provoking masterpiece, Dive into the World of **Antiviral Drug Resistance** . This educational ebook, conveniently sized in PDF (*), is a gateway to personal growth and intellectual stimulation. Immerse yourself in the enriching content curated to cater to every eager mind. Download now and embark on a learning journey that promises to expand your horizons. .

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Antiviral Drug Resistance Introduction

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