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Emerging Drugs and Targets for Multiple Sclerosis **Designing Multi-Target Drugs** *Membrane Proteins as Drug Targets* **Target Discovery and Validation** *Emerging Drugs and Targets for Alzheimer's Disease* The Science and Business of Drug Discovery *Emerging Drugs and Targets for Parkinson's Disease* **Reviews on New Drug Targets in Age-Related Disorders** *Drug Targets in Cellular Processes of Cancer: From Nonclinical to Preclinical Models* **Drug Discovery and Development Target Validation in Drug Discovery Phenotypic Drug Discovery How Drugs Work Reviews on New Drug Targets in Age-Related Disorders Structural Biology in Drug Discovery Basic Principles of Drug Discovery and Development** *Handbook of Biomarkers and Precision Medicine* **Lipospheres in Drug Targets and Delivery** Biologics, Biosimilars, and Biobetters **Improving and Accelerating Therapeutic Development for Nervous System Disorders New Drugs and Targets for Asthma and COPD** *Synthesis of Best-Seller Drugs* Ion Channel Drug Discovery **Emerging Drugs and Targets for Alzheimer's Disease** Enzymes as Targets for Drug Design Transporters as Drug Targets *Bio-Targets and Drug Delivery Approaches* **Drug Discovery for Leishmaniasis Nuclear Receptors as Drug Targets Drug Discovery Toxicology** *Polypharmacology in Drug Discovery* **In Silico Technologies in Drug Target Identification and Validation** Target Discovery and Validation **Antiviral Drug Discovery and Development Drug Repurposing in Cancer Therapy** *The Organic Chemistry of Drug Design and Drug Action* **Carbonic Anhydrase as Drug Target** New Paradigms in Neuroscience and Related Targets for Drug Discovery **Drug Design and Discovery in Alzheimer’s Disease Molecular Pharmacology**

Drug Repurposing in Cancer Therapy: Approaches and Applications provides comprehensive and updated information from experts in basic science research and clinical practice on how existing drugs can be repurposed for cancer treatment. The book summarizes successful stories that may assist researchers in the field to better design their studies for new repurposing projects. Sections discuss specific topics such as in silico prediction and high throughput screening of repurposed drugs, drug repurposing for overcoming chemoresistance and eradicating cancer stem cells, and clinical investigation on combination of repurposed drug and anticancer therapy. Cancer researchers, oncologists, pharmacologists and several members of biomedical field who are interested in learning more about the use of existing drugs for different purposes in cancer therapy will find this to be a valuable resource. Presents a systematic and up-to-date collection of the research underpinning the various drug repurposing approaches for a quick, but in-depth understanding on current trends in drug repurposing research Brings better understanding of the drug repurposing process in a holistic way, combining both basic and clinical sciences Encompasses a collection of successful stories of drug repurposing for cancer therapy in different cancer types Standard medicinal chemistry courses and texts are organized by classes of drugs with an emphasis on descriptions of their biological and pharmacological effects. This book represents a new approach based on physical organic chemical principles and reaction mechanisms that allow the reader to extrapolate to many related classes of drug molecules. The Second Edition reflects the significant changes in the drug industry over the past decade, and includes chapter problems and other elements that make the book more useful for course instruction. New edition includes new chapter problems and exercises to help students learn, plus extensive references and illustrations Clearly presents an organic chemist's perspective of how drugs are designed and function, incorporating the extensive changes in the drug industry over the past ten years Well-respected author has published over 200 articles, earned 21 patents, and invented a drug that is under consideration for commercialization As opposed to other books on the topic, this volume is unique in also covering emerging transporter targets. Following a general introduction to the importance of targeting transporter proteins with drugs, the book systematically presents individual transporter classes and explains their pharmacology and physiology. The text covers all transporter families with known or suspected importance as drug targets, including neurotransmitter transporters, ABC transporters, glucose transporters and organic ion transporters. The final part discusses recent advances in structural studies of transport proteins, assay methods for transport activity, and the systems biology of transporters and their regulation. With its focus on drug development issues, this authoritative overview is required reading for researchers in industry and academia targeting transport proteins for the treatment of disease. This book explores potential cellular drug targets for cancer therapy. The first couple of chapters describe conventional treatment (radiotherapy, chemotherapy, and immunotherapy) & detection (biosensors) strategies for cancer. In contrast, the subsequent chapters address the role of cyclin-dependent kinases and cell cycle regulatory proteins in the growth of cancer cells and their potential as target for cancer treatment. The book then discusses the regulation of various pro-apoptotic and anti-apoptotic proteins via chemotherapeutic drugs. In addition, it examines the molecular mechanisms that are critical for mediating autophagic cell death in cancer cells. It subsequently reviews the role of reactive oxygen (ROS) species during carcinogenesis and during chemotherapy, and the potential of anti-inflammatory routes for the development of new therapeutic modulators. Lastly, it describes therapeutic strategies that target the tumor microenvironment and various angiogenic pathways for the treatment of cancer and to develop personalized medicine. Given its scope, the book is valuable resource for oncologists, cancer researchers, clinicians, and pharmaceutical industry personnel. Phenotypic drug discovery has been highlighted in the past decade as an important strategy in the discovery of novel medical entities. This book aims to equip researchers with a thought-provoking guide to the application and development of contemporary phenotypic drug discovery for clinical success. Lipospheres in Drug Targets and Delivery: Approaches, Methods, and Applications presents an overview of the most recent applications of lipospheres primarily in the field of medicine, pharmaceutics, and biotechnology. It includes chapters on preparation, characterization, delivery (of peptides, proteins, vaccines, nucleic acids), therapeutic applic This volume describes the discovery and development history of the most promising drugs now in development for combating Alzheimer's disease. "The field of Biomarkers and Precision Medicine in drug development is rapidly evolving and this book presents a snapshot of exciting new approaches. By presenting a wide range of biomarker applications, discussed by knowledgeable and experienced scientists, readers will develop an appreciation of the scope and breadth of biomarker knowledge and find examples that will help them in their own work." -Maria Freire, Foundation for the National Institutes of Health Handbook of Biomarkers and Precision Medicine provides comprehensive insights into biomarker discovery and development which has driven the new era of Precision Medicine. A wide variety of renowned experts from government, academia, teaching hospitals, biotechnology and pharmaceutical companies share best practices, examples and exciting new developments. The handbook aims to provide in-depth knowledge to research scientists, students and decision makers engaged in Biomarker and Precision Medicine-centric drug development. Features: Detailed insights into biomarker discovery, validation and diagnostic development with implementation strategies Lessons-learned from successful Precision Medicine case studies A variety of exciting and emerging biomarker technologies The next frontiers and future challenges of biomarkers in Precision Medicine Claudio Carini, Mark Fidock and Alain van Gool are internationally recognized as scientific leaders in Biomarkers and Precision Medicine. They have worked for decades in academia and pharmaceutical industry in EU, USA and Asia. Currently, Dr. Carini is Honorary Faculty at Kings’s College School of Medicine, London, UK. Dr. Fidock is Vice President of Precision Medicine Laboratories at AstraZeneca, Cambridge, UK. Prof.dr. van Gool is Head Translational Metabolic Laboratory at Radboud university medical school, Nijmegen, NL. The modern drug developers? guide for making informed choices among the diverse target identification methods Target Discovery and Validation: Methods and Strategies for Drug Discovery offers a hands-on review of the modern technologies for drug target identification and validation. With contributions from noted industry and academic experts, the book addresses the most recent chemical, biological, and computational methods. Additionally, the book highlights techologies that are applicable to ?difficult? targets and drugs directed at multiple targets, including chemoproteomics, activity-based protein profiling, pathway mapping, genome-wide association studies, and array-based profiling. Throughout, the authors highlight a range of diverse approaches, and target validation studies reveal how these methods

can support academic and drug discovery scientists in their target discovery and validation research. This resource: -Offers a guide to identifying and validating targets, a key enabling technology without which no new drug development is possible -Presents the information needed for choosing the appropriate assay method from the ever-growing range of available options -Provides practical examples from recent drug development projects, e. g. in kinase inhibitor profiling Written for medicinal chemists, pharmaceutical professionals, biochemists, biotechnology professionals, and pharmaceutical chemists, Target Discovery and Validation explores the current methods for the identification and validation of drug targets in one comrpehensive volume. It also includes numerous practical examples. Affecting over 1.5 million people across the world, Parkinson's disease is a progressive neurological condition characterized, in part, by the loss of dopaminergic neurons in the substantia nigra pars compacta. It affects 1.5% of the global population over 65 years of age. As life expectancy is increasing, over the next few years the number of patients with Parkinson´s disease will grow exponentially. To date, there are no available treatments that are capable of curing Parkinson´s disease, and the current goal of therapy, dopamine replacement strategies, is to reduce symptoms. After several years of disease progression, treatment is complicated by the onset of motor fluctuations and dyskinesias. This information reveals the great importance and social need of finding an effective therapeutic intervention for Parkinson´s disease. This exemplary new book reviews some of the most outstanding examples of new drugs currently in pharmaceutical development or new targets currently undergoing the validation process to try to reach the Parkinson´s drug market in the next few years as potential disease modifying drugs. Providing up to date and comprehensive coverage, this book is essential reading for researchers working in academia and industry in any aspect of medicinal chemistry or drug discovery. A comprehensive primer and reference, this book provides pharmacists and health practitioners the relevant science and policy concepts behind biologics, biosimilars, and biobetters from a practical and clinical perspective. Explains what pharmacists need to discuss the equivalence, efficacy, safety, and risks of biosimilars with physicians, health practitioners, and patients about Guides regulators on pragmatic approaches to dealing with these drugs in the context of rapidly evolving scientific and clinical evidence Balances scientific information on complex drugs with practical information, such as a checklist for pharmacists Basic Principles of Drug Discovery and Development presents the multifaceted process of identifying a new drug in the modern era, which requires a multidisciplinary team approach with input from medicinal chemists, biologists, pharmacologists, drug metabolism experts, toxicologists, clinicians, and a host of experts from numerous additional fields. Enabling technologies such as high throughput screening, structure-based drug design, molecular modeling, pharmaceutical profiling, and translational medicine are critical to the successful development of marketable therapeutics. Given the wide range of disciplines and techniques that are required for cutting edge drug discovery and development, a scientist must master their own fields as well as have a fundamental understanding of their collaborator’s fields. This book bridges the knowledge gaps that invariably lead to communication issues in a new scientist’s early career, providing a fundamental understanding of the various techniques and disciplines required for the multifaceted endeavor of drug research and development. It provides students, new industrial scientists, and academics with a basic understanding of the drug discovery and development process. The fully updated text provides an excellent overview of the process and includes chapters on important drug targets by class, in vitro screening methods, medicinal chemistry strategies in drug design, principles of in vivo pharmacokinetics and pharmacodynamics, animal models of disease states, clinical trial basics, and selected business aspects of the drug discovery process. Provides a clear explanation of how the pharmaceutical industry works, as well as the complete drug discovery and development process, from obtaining a lead, to testing the bioactivity, to producing the drug, and protecting the intellectual property Includes a new chapter on the discovery and development of biologics (antibodies proteins, antibody/receptor complexes, antibody drug conjugates), a growing and important area of the pharmaceutical industry landscape Features a new section on formulations, including a discussion of IV formulations suitable for human clinical trials, as well as the application of nanotechnology and the use of transdermal patch technology for drug delivery Updated chapter with new case studies includes additional modern examples of drug discovery through high through-put screening, fragment-based drug design, and computational chemistry Aging is an inevitable part of life and is becoming a worldwide social, economic and health problem. This is mainly due to the fact that the increasing proportion of individuals in the advanced age category have a higher probability of developing age-related disorders, such as type II diabetes mellitus, cardiovascular disorders, sarcopenia, and neurodegenerative conditions. New therapeutic approaches are still needed to decrease or slow the effects of such diseases. Advances in -omic technologies, such as genomics, transcriptomics, proteomics and metabolomics, have significantly advanced our understanding of disease in multiple medical areas, as the analysis of multiple molecular networks has simultaneously provided a more integrated view of disease pathways. It is hoped that emerging hits from these analyses might be prioritized for further screening as potential novel drug targets for increasing the human healthspan in line with the lifespan. In turn, this will lead to new therapeutic strategies as well as drug development projects by the pharmaceutical industry. This book presents a series of reviews describing studies that have resulted in identification of new potential drug targets for age-related disorders. Much of this information has come from -omic comparisons of healthy and disease states or from testing the effects of new therapeutic approaches. Authored by experts from around the globe, each chapter is presented in the context of specific chronic diseases or therapeutic strategies. This book is designed for researchers in the areas of aging and chronic disease, as well as clinical scientists, physicians and stakeholders in major drug companies. Enzymes as Targets for Drug Design is a collection of scientific discussions related to enzyme inhibitors that show the many facets of the drug discovery process from the basic sciences through clinical applications. Topics include the biogenesis of phosphatidylinositol glycosyl membrane proteins, structure and catalytic function of ADP-ribose polymerase (ADPRT), and modulation of the dopaminergic system in cardiovascular therapeutics. The therapeutic utility of selected enzyme-activated irreversible inhibitors, the role of proteinases in the fibrosis of systemic sclerosis, and therapeutic opportunities in eicosanoid biosynthesis are also discussed. This book consists of 18 chapters and begins with examples of enzymes whose activities have recently been elucidated, or for which newer insights have been gleaned, but which do not yet have selective or potent inhibitors. The second part provides examples of enzymes where inhibitors have been identified but it is still not clear whether or not such an enzymatic blockade will be therapeutically beneficial. The final section describes clinical studies of newer, and not so new, enzyme inhibitors that are clearly of therapeutic importance. The therapeutic activity of monoamine oxidase inhibitors and the associated clinical issues are considered. This book is intended for clinicians as well as basic scientists in biochemistry, chemistry, pharmacology, and cell biology. This book describes the processes that are involved in the development of new drugs. The authors discuss the history, role of natural products and concept of receptor interactions with regard to the initial stages of drug discovery. In a single, highly readable volume, it outlines the basics of pharmacological screening, drug target identification, and genetics involved in early drug discovery. The final chapters introduce readers to stem therapeutics, pharmacokinetics, pharmacovigilance, and toxicological testing. Given its scope, the book will enable research scholars, professionals and young scientists to understand the key fundamentals of drug discovery, including stereochemistry, pharmacokinetics, clinical trials, statistics and toxicology. Synthesis of Best-Seller Drugs is a key reference guide for all those involved with the design, development, and use of the best-selling drugs. Designed for ease of use, this book provides detailed information on the most popular drugs, using a practical layout arranged according to drug type. Each chapter reviews the main drugs in each of nearly 40 key therapeutic areas, also examining their classification, novel structural features, models of action, and synthesis. Of high interest to all those who work in the captivating areas of biologically active compounds and medicinal drug synthesis, in particular medicinal chemists, biochemists, and pharmacologists, the book aims to support current research efforts, while also encouraging future developments in this important field. Describes methods of synthesis, bioactivity and related drugs in key therapeutic areas Reviews the main drugs in each of nearly 40 key therapeutic areas, also examining their classification, novel structural features, models of action, and more Presents a practical layout designed for use as a quick reference tool by those working in drug design, development and implementation This book summarizes 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. Drug Design and Discovery in Alzheimer’s Disease includes expert reviews of recent developments in Alzheimer's disease (AD) and neurodegenerative disease research. Originally published by Bentham as Frontiers in Drug Design and Discovery, Volume 6and now distributed by Elsevier, this compilation of the sixteen articles, written by leading global researchers, focuses on key developments in the understanding of the disease at molecular levels, identification and validation of molecular targets, as well as innovative approaches towards drug discovery, development, and delivery. Beginning with an overview of AD pharmacotherapy and existing blockbuster drugs, the reviews cover the potential of both natural and synthetic small molecules; the role of cholinesterases in the on-set and progression of AD and their inhibition; the role of beta-site APP clearing enzyme-1 (BACE-1) in the production of ß-amyloid proteins, one of the key reasons of the progression of AD; and other targets identified for AD drug discovery. Edited and written by leading experts in Alzheimer’s disease (AD) and other neurodegenerative disease drug development Describes existing drugs for AD and current molecular understanding of the condition Reviews recent advances in the field, including coverage of cholinesterases, BACE-1, and other drug development targets Primary healthcare premises are increasingly becoming more sophisticated offering health promotion minor surgery and specialist services. The acquisition of new premises expansion or investment in traditional surgeries can be the greatest financial commitment and also one of the most daunting. This book is specifically written to enable development with minimal disruption to the daily medical routine. The book contains viewpoints of specialists with many years' experience gained from working in their individual fields. It is essential reading for GPs trainees practice managers and professional advisers to general practice. Specialist architects solicitors financial advisors accountants and health authority managers will also achieve a better understanding of this complex subject. Edited by two experts working at the pioneering pharmaceutical company and major global player in hormone-derived drugs, this handbook and reference systematically treats the drug development aspects of all human nuclear receptors, including recently characterized receptors such as PPAR, FXR and LXR. Authors from leading pharmaceutical companies around the world present examples and real-life data from their own work. This textbook provides a fresh, comprehensive and accessible introduction to the rapidly expanding field of molecular pharmacology. Adopting a drug target-based, rather than the traditional organ/system based, approach this innovative guide reflects the current advances and research trend towards molecular based drug design, derived from a detailed understanding of chemical responses in the body. Drugs are then tailored to fit a treatment profile, rather than the traditional method of ‘trial and error’ drug discovery which focuses on testing chemicals on animals or cell cultures and matching their effects to treatments. Providing an invaluable resource for advanced under-graduate and MSc/PhD students, new researchers to the field and practitioners for continuing professional development, Molecular Pharmacology explores; recent advances and developments in the four major human drug target families (G-protein coupled receptors, ion channels, nuclear receptors and transporters), cloning of drug targets, transgenic animal technology, gene therapy, pharmacogenomics and looks at the role of calcium in the cell. Current - focuses on cutting edge techniques and approaches, including new methods to quantify biological activities in different systems and ways to interpret and understand pharmacological data. Cutting Edge - highlights advances in pharmacogenomics and explores how an individual’s genetic makeup influences their response to therapeutic drugs and the potential for harmful side effects. Applied - includes numerous, real-world examples and a detailed case-study based chapter which looks at current and possible future treatment strategies for cystic fibrosis. This case study considers the relative merits of both drug therapy for specific classes of mutation and gene therapy to correct the underlying defect. Accessible - contains a comprehensive glossary, suggestions for further reading at the end of each chapter and an associated website that provides a complete set of figures from within the book. The modern drug developers? guide for making informed choices among the diverse target identification methods Target Discovery and Validation: Methods and Strategies for Drug Discovery offers a hands-on review of the modern technologies for drug target identification and validation. With contributions from noted industry and academic experts, the book addresses the most recent chemical, biological, and computational methods. Additionally, the book highlights techologies that are applicable to ?difficult? targets and drugs directed at multiple targets, including chemoproteomics, activity-based protein profiling, pathway mapping, genome-wide association studies, and array-based profiling. Throughout, the authors highlight a range of diverse approaches, and target validation studies reveal how these methods can support academic and drug discovery scientists in their target discovery and validation research. This resource: -Offers a guide to identifying and validating targets, a key enabling technology without which no new drug development is possible -Presents the information needed for choosing the appropriate assay method from the ever-growing range of available options -Provides practical examples from recent drug development projects, e. g. in kinase inhibitor profiling Written for medicinal chemists, pharmaceutical professionals, biochemists, biotechnology professionals, and pharmaceutical chemists, Target Discovery and Validation explores the current methods for the identification and validation of drug targets in one comrpehensive volume. It also includes numerous practical examples. This work presents a comprehensive contemporary framework for approaching target validation in drug discovery. It begins with a detailed description of new enabling technologies, including aptamers, RNA interference, functional genomics, and proteomics. The next section looks at biologic drug development with in-depth discussion of lessons learned from such well-known cases as Erbitux, Herceptin, and Avastin. Additional targets known as "second generation" drugs, which can be identified when disease pathways are validated by biologics, present new possible small molecule therapeutics and serve as the focus of the final section of the book. Ion channel drug discovery is a rapidly evolving field fuelled by recent, but significant, advances in our understanding of ion channel function combined with enabling technologies such as automated electrophysiology. The resurgent interest in this target class by both pharmaceutical and academic scientists was clearly highlighted by the over-subscribed RSC/BPS 'Ion Channels as Therapeutic Targets' symposium in February 2009. This book builds on the platform created by that meeting, covering themes including advances in screening technology, ion channel structure and modelling and up-to-date case histories of the discovery of modulators of a range of channels, both voltage-gated and non-voltage-gated channels. The editors have built an extensive network of contacts in the field through their first-hand scientific experience, collaborations and conference participation and the organisation of the meeting at Novartis, Horsham, increased the network enabling the editors to draw on the experience of eminent researchers in the field. Interest and investment in ion channel modulation in both industrial and academic settings continues to grow as new therapeutic opportunities are identified and realised for ion channel modulation. This book provides a reference text by covering a combination of recent advances in the field, from technological and medicinal chemistry perspectives, as well as providing an introduction to the new 'ion channel drug discoverer'. The book has contributions from highly respected academic researchers, industrial researchers at the cutting edge of drug discovery and experts in enabling technology. This combination provides a complete picture of the field of interest to a wide range of readers. Asthma, allergy and chronic obstructive lung disease are common throughout the world and are increasing in incidence, particularly in the developing world. This volume provides a state-of-the-art account of the identification of new targets and the development of new therapies for these conditions. Some 40 chapters by clinical academics and senior members of the pharmaceutical industry detail the latest breakthroughs in research and development. In asthma, a promising approach is the use of therapy directed against specific Th2 responses through biological antagonists of IL-5, IL-4 and IL-13. There have also been major advances in our understanding of innate immune responses to pathogen-associated molecular patterns, and in the area of Toll-like receptors. Up to date and comprehensive, this book will be of particular relevance to those working in the pharmaceutical industry (in preclinical research and clinical development), to academic researchers in the field of respiratory medicine, and to respiratory health care specialists. This book offers deep insights into the thermodynamics and molecular structures of the twelve catalytically active isoforms of human carbonic anhydrase (CA) with a particular

focus on inhibitor binding for drug design. X-ray crystallographic structures in combination with enzyme kinetic testing provide information on the interaction of CAs and their inhibitors, knowledge which is crucial for rational drug design. CAs are zinc carrying enzymes that catalyse the reversible interconversion of carbon dioxide and bicarbonate and are involved in numerous cellular processes. They are therefore a common target for drugs. The suppression of CA activities through inhibitory compounds has found application for example in diuretics and in glaucoma therapy. In this book methods used to determine binding thermodynamics of inhibitory compounds (Isothermal titration calorimetry, Fluorescent thermal shift assay/differential scanning fluorimetry and others) will be compared in detail. Also types and chemical synthesis of CA inhibitors, the use of antibodies against CAs as well as inhibitor application in animals are discussed. The Science and Business of Drug Discovery is written for those who want to learn about the biopharmaceutical industry and its products whatever their level of technical knowledge. Its aim is to demystify the jargon used in drug development, but in a way that avoids over simplification and the resulting loss of key information. Each of the nineteen chapters is illustrated with figures and tables which clarify some of the more technical points being made. Also included is a drug discovery case history which draws the relevant material together into a single chapter. In recognizing that it is difficult to navigate through the many external resources dealing with drug development, the book has been written to guide the reader towards the most appropriate information sources, including those listed in the two appendices. The following topics are covered: Different types of drugs: from small molecules to stem cells Background to chemistry of small and large molecules Historical background to drug discovery, pharmacology and biotechnology The drug discovery pipeline: from target discovery to marketed medicine Commercial aspects of drug discovery Challenges to the biopharmaceutical industry and its responses Material of specific interest to technology transfer executives, recruiters and pharmaceutical translators. Alzheimer's disease is the most prevalent neurodegenerative disorder in the elderly. A recent study from the Bloomberg School of Public Health recently estimated that over 26 million people were living with the disease in 2006 and that the global prevalence of the disease will grow to 106 million by 2050. By that time, 43 per cent of those living with the disease will need high-level care, equivalent to that of a nursing home. However, even if modest advances in preventing or delaying the disease's progression were made, it could have a huge impact on global public health. According to this study, interventions that could delay the onset of the disease by as little as one year would reduce the prevalence of the disease by 12 million fewer cases in 2050. These figures reinforce how important it is to find an effective intervention for Alzheimer's disease. Emerging Drugs and Targets for Alzheimer's Disease collects some of the most outstanding examples of new drugs currently under pharmaceutical development or new targets in the validation process that will reach the Alzheimer's drug market over the next few years as disease modifying drugs. Written by a team of distinguished experts Volume 1: Beta-Amyloid, Tau Protein and Glucose Metabolism is an essential resource for scientists in the pharmaceutical and biotechnology industries and academics working in the neurosciences field. The pharmaceutical industry relies on numerous well-designed experiments involving high-throughput techniques and in silico approaches to analyze potential drug targets. These in silico methods are often predictive, yielding faster and less expensive analyses than traditional in vivo or in vitro procedures. In Silico Technologies in Drug Target Identification and Validation addresses the challenge of testing a growing number of new potential targets and reviews currently available in silico approaches for identifying and validating these targets. The book emphasizes computational tools, public and commercial databases, mathematical methods, and software for interpreting complex experimental data. The book describes how these tools are used to visualize a target structure, identify binding sites, and predict behavior. World-renowned researchers cover many topics not typically found in most informatics books, including functional annotation, siRNA design, pathways, text mining, ontologies, systems biology, database management, data pipelining, and pharmacogenomics. Covering issues that range from prescreening target selection to genetic modeling and valuable data integration, In Silico Technologies in Drug Target Identification and Validation is a self-contained and practical guide to the various computational tools that can accelerate the identification and validation stages of drug target discovery and determine the biological functionality of potential targets more effectively. 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. Aging is an inevitable part of life, and is becoming a worldwide social, economic and health problem due to the fact that an increasing proportion of individuals in the advanced age category have a higher probability of developing age-related disorders. New therapeutic approaches are still in need to decrease or slow the effects of such diseases in this aging society. Advances in ‘omic technologies such as genomics, transcriptomics, proteomics and metabolomics have significantly advanced our understanding of diseases in multiple medical areas. It is hoped that emerging hits from these analyses might be prioritized for further screening as potential novel drug targets for increasing the human healthspan in line with the lifespan, which will in turn lead to new therapeutic strategies and drug development projects by the pharmaceutical industry. This new book presents a series of reviews describing studies which have resulted in the identification of potential new drug targets for age-related disorders. Much of this information has come from ‘omic comparisons of healthy and disease states or from testing the effects of potential new therapeutic approaches. Each chapter will be presented in the context of specific chronic diseases or different therapeutic strategies, providing important information on disease mechanisms related to the aging process. This book will be of interest to researchers in the areas of aging and chronic disease, as well as clinical scientists, physicians, and major drug companies. With contributors from Australia, Brazil, Canada, France, Germany, India, Iran, Iraq, South Africa, South Korea, Thailand, Ukraine, United Kingdom, United States of America, Uruguay and Vietnam, this is a timely follow up to Guest’s previous book Reviews on New Drug Targets in Age-Related Disorders. As a guide for pharmaceutical professionals to the issues and practices of drug discovery toxicology, this book integrates and reviews the strategy and application of tools and methods at each step of the drug discovery process. • Guides researchers as to what drug safety experiments are both practical and useful • Covers a variety of key topics – safety lead optimization, in vitro-in vivo translation, organ toxicology, ADME, animal models, biomarkers, and –omics tools • Describes what experiments are possible and useful and offers a view into the future, indicating key areas to watch for new predictive methods • Features contributions from firsthand industry experience, giving readers insight into the strategy and execution of predictive toxicology practices Multi-target drug discovery (MTDD) is an emerging area of increasing interest to the drug discovery community. Drugs that modulate several targets have the potential for an improved balance of efficacy and safety compared to single targets agents. Although there are a number of marketed drugs that are thought to derive their therapeutic benefit by virtue of interacting with multiple targets, the majority of these were discovered accidentally. Written by world renowned experts, this is the first book to gather together knowledge and experiences of the rational discovery of multi-target drugs. It describes the current state of the art, the achievements and the challenges of the field and importantly the lessons learned by researchers to date and their application to future MTDD. Improving and Accelerating Therapeutic Development for Nervous System Disorders is the summary of a workshop convened by the IOM Forum on Neuroscience and Nervous System Disorders to examine opportunities to accelerate early phases of drug development for nervous system drug discovery. Workshop participants discussed challenges in neuroscience research for enabling faster entry of potential treatments into first-in-human trials, explored how new and emerging tools and technologies may improve the efficiency of research, and considered mechanisms to facilitate a more effective and efficient development pipeline. There are several challenges to the current drug development pipeline for nervous system disorders. The fundamental etiology and pathophysiology of many nervous system disorders are unknown and the brain is inaccessible to study, making it difficult to develop accurate models. Patient heterogeneity is high, disease pathology can occur years to decades before becoming clinically apparent, and diagnostic and treatment biomarkers are lacking. In addition, the lack of validated targets, limitations related to the predictive validity of animal models - the extent to which the model predicts clinical efficacy - and regulatory barriers can also impede translation and drug development for nervous system disorders. Improving and Accelerating Therapeutic Development for Nervous System Disorders identifies avenues for moving directly from cellular models to human trials, minimizing the need for animal models to test efficacy, and discusses the potential benefits and risks of such an approach. This report is a timely discussion of opportunities to improve early drug development with a focus toward preclinical trials. The advances in drug delivery systems over recent years have resulted in a large number of novel delivery systems with the potential to revolutionize the treatment and prevention of diseases. Bio-Targets and Drug Delivery Approaches is an easy-to-read book for students, researchers and pharmaceutical scientists providing a comprehensive introduction to the principles of advanced drug delivery and targeting their current applications and potential future

developments. For human health, leishmaniasis is among the most important protozoan diseases, superseded only by malaria. Globally, 10 to 12 million people are infected with 1.5 million new cases every year. The development of cheaper new drugs is urgently needed for this neglected disease that is developing resistance to current treatments. Chemotherapy remains the only treatment option for the bulk of patients. However, this is largely unaffordable for most. In the past three years numerous advances in drug discovery have been made for treating this disease by exploiting diverging metabolic pathways between the Leishmania enzymes and their hosts, using nanotechnology to target the immune cell phagolysosomes where Leishmania resides. Drug Discovery for Leishmaniasis aims to provide a perspective of the current treatments and their challenges, blended with the emerging strategies and methodologies that will drive new target appraisals and drug developments, as well as addressing the molecular basis of resistance in Leishmania. Recent studies have shown that leishmaniasis affects some of the poorest people in the world, with 95% of fatal cases occurring in only 6 countries. With the WHO goal of eliminating this public health problem in the South-east Asia Region by 2020, this book will be important for anyone who is interested in neglected tropical diseases. Membrane proteins continue to be prime drug targets because they perform essential processes in the cell including controlling the flow of information and materials between cells and mediating activities like hormone action and nerve impulses. The study of membrane proteins could lead to new and improved pharmaceutical treatments for a wide range of illnesses such as heart disease, cystic fibrosis and depression. This volume reviews the latest developments in the field. * Discusses new discoveries, approaches, and ideas in the field of membrane proteins and reviews how they are being used to develop new drugs * Contributions from leading scholars and industry experts * Reference guide for researchers involved in molecular biology and related fields Multiple sclerosis (MS) is a complex disease with a presumed autoimmune aetiology and few current effective treatments. Disease modifying therapies focus on the altering the natural course of relapsing and remitting MS, targeting the inflammatory response. Other targets involve tacking the cause of the disease – demyelination of axons through remyelination therapies. Due to several recent breakthroughs in the understanding of the pathophysiology of MS new targets for remyelination and immunomodulation are rapidly emerging. This book provides a comprehensive overview of drug discovery and development for the molecular basis of the disease, from new targets to drugs currently in clinical development, cellular and animal disease models to biomarkers for diagnosis and assessment in clinical trials. Emerging Drugs and Targets for Multiple Sclerosis is an ideal reference for any student or researcher interested in drug development for neurodegenerative diseases, autoimmune diseases and MS in particular. An essential outline of the main facets of polypharmacology in drug discovery research Extending drug discovery opportunities beyond the "one drug, one target" philosophy, a polypharmacological approach to the treatment of complex diseases is emerging as a hot topic in both industry and academic research. Polypharmacology in Drug Discovery presents an overview of the various facets of polypharmacology and how it can be applied as an innovative concept for developing medicines for treating bacterial infections, epilepsy, cancer, psychiatric disorders, and more. Filled with a collection of instructive case studies that reinforce the material and illuminate the subject, this practical guide: Covers the two-sided nature of polypharmacology—its contribution to adverse drug reactions and its benefit in certain therapeutic drug classes Addresses the important topic of polypharmacology in drug discovery, a subject that has not been thoroughly covered outside of scattered journal articles Overviews state-of-the-art approaches and developments to help readers understand concepts and issues related to polypharmacology Fosters interdisciplinary drug discovery research by embracing computational, synthetic, in vitro and in vivo pharmacological and clinical aspects of polypharmacology A clear road map for helping readers successfully navigate around the problems involved with promiscuous ligands and targets, Polypharmacology in Drug Discovery provides real examples, in-depth explanations and discussions, and detailed reviews and opinions to spark inspiration for new drug discovery projects. With the most comprehensive and up-to-date overview of structure-based drug discovery covering both experimental and computational approaches, Structural Biology in Drug Discovery: Methods, Techniques, and Practices describes principles, methods, applications, and emerging paradigms of structural biology as a tool for more efficient drug development. Coverage includes successful examples, academic and industry insights, novel concepts, and advances in a rapidly evolving field. The combined chapters, by authors writing from the frontlines of structural biology and drug discovery, give readers a valuable reference and resource that: Presents the benefits, limitations, and potentiality of major techniques in the field such as X-ray crystallography, NMR, neutron crystallography, cryo-EM, mass spectrometry and other biophysical techniques, and computational structural biology Includes detailed chapters on druggability, allostery, complementary use of thermodynamic and kinetic information, and powerful approaches such as structural chemogenomics and fragment-based drug design Emphasizes the need for the in-depth biophysical characterization of protein targets as well as of therapeutic proteins, and for a thorough quality assessment of experimental structures Illustrates advances in the field of established therapeutic targets like kinases, serine proteinases, GPCRs, and epigenetic proteins, and of more challenging ones like protein-protein interactions and intrinsically disordered proteins

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