Sulfation Of Drugs And Related Compounds

First Published in 1981, this book is an in-depth exploration into the sulfation process in the manufacturing of pharmaceuticals. Carefully compiled and filled with a vast repertoire of notes, diagrams, and references this book serves as a useful reference for Students of Pharmacology, and other practitioners in their respective fields.

Written by internationally recognized leaders in Heparanase biology, the book's eight chapters offer an opportunity for scientists, clinicians and advanced students in cell biology, tumor biology and oncology to obtain a comprehensive understanding of Heparanase's multifaceted activities in cancer, inflammation, diabetes and other diseases, as well as its related clinical applications. Proteases and their involvement in cancer progression have been well addressed and documented; however, the emerging premise presented within this book is that Heparanase is a master regulator of aggressive cancer phenotypes and crosstalk with the tumor microenvironment. This endoglycosidase contributes to tumor-mediated remodeling of the extracellular matrix and cell surfaces, augmenting the bioavailability of pro-tumorigenic and pro-inflammatory growth factors and cytokines that are bound to Heparan sulfate. Compelling evidence ties Heparanase with all steps of tumor progression including tumor initiation, growth, angiogenesis, metastasis, and chemoresistance, supporting the notion that Heparanase is an important contributor to the poor outcome of cancer patients and a validated target for therapy. Unlike Heparanase, heparanase-2, a close homolog of Heparanase, lacks enzymatic activity, inhibits Heparanase, and regulates selected genes that promote normal differentiation and tumor suppression. Written by internationally recognized leaders in Heparanase biology, this volume presents a comprehensive understanding of Heparanase's multifaceted activities in cancer, inflammation, diabetes and other diseases, as well as its related clinical applications to scientists, clinicians and advanced students in cell biology, tumor biology and oncology.

Environmental toxicology is generally held to be the study of the potential of constituents of outdoor environments to impact either human health or the biological structure of the ecosystems involved. This volume is a first attempt to integrate toxicological studies of all of the many human environments, both indoor and outdoor, and their complex interrelationships. Included are considerations of natural environments, the agroecosystem, occupational, urban and domestic environments as well as the environment associated with Superfund sites and military deployments. The primary emphasis is on public health, including the potential health effects of toxicants found in different environments, the bioprocessing of such toxicants in humans and surrogate animals and the principles of risk analysis. Approaches the toxicology of human environments in a new and unique way, stressing the complex interrelationships of all human environments and the implication for human and environmental health Each chapter is written by an acknowledged expert and is addressed to those interested in the broader implications of the environmental modifications that are always associated with the activities of humans living and working in them

Of the thousands of novel compounds that a drug discovery project team invents and that bind to the therapeutic target, typically only a fraction of these have sufficient ADME/Tox properties to become a drug product. Understanding ADME/Tox is critical for all drug researchers, owing to its increasing importance in advancing high quality candidates to clinical studies and the processes of drug discovery. If the properties are weak, the candidate will have a high risk of failure or be less desirable as a drug product. This book is a tool and resource for scientists engaged in, or preparing for, the selection and optimization process. The authors describe how properties affect in vivo pharmacological activity and impact in vitro assays. Individual drug-like properties are discussed from a practical point of view, such as solubility, permeability and metabolic stability, with regard to fundamental understanding, applications of property data in drug discovery and examples of structural modifications that have achieved improved property performance. The authors also review various methods for the screening (high throughput), diagnosis (medium throughput) and in-depth (low throughput) analysis of drug properties. * Serves as an essential working handbook aimed at scientists and students in medicinal chemistry * Provides practical, step-by-step guidance on property fundamentals, effects, structure-property relationships, and structure modification strategies * Discusses improvements in pharmacokinetics from a practical chemist's standpoint

ADME-Enabling Technologies in Drug Design and Development

Casarett & Doull's Essentials of Toxicology

The Practice of Medicinal Chemistry

Glycosaminoglycans in Development, Health and Disease

Drug Metabolism in Drug Design and Development

Glycosylation and Cancer

In-depth coverage of advances in molecular biology, indicating the importance of drug and xenobiotic conjugates as transport forms of biologically active compounds. Part One describes molecular events associated with the expression and regulation of transferases and hydrolases involved in Phase II drug conjugation and deconjugation. Part Two deals with the regulation of Phase II conjugation, while Part Three critically reviews the importance of drug conjugates in pharmacology and toxicology. An up-to-date source of information of broad interest to pharmacologists and toxicologists.

The past decade has seen major advances in the cloning of genes encoding enzymes of plant secondary metabolism. This has been further enhanced by the recent project on the sequencing of the Arabidopsis genome. These developments provide the molecular genetic basis to address the question of the Evolution of Metabolic Pathways. This volume provides in-depth reviews of our current knowledge on the evolutionary origin of plant secondary metabolites and the enzymes involved in their biosynthesis. The chapters cover five major topics: 1. Role of secondary metabolites in evolution; 2. Evolutionary origins of polyketides and terpenes; 3. Roles of oxidative reactions in the evolution of secondary metabolism; 4. Evolutionary origin of substitution reactions: acylation, glycosylation and methylation; and 5. Biochemistry and molecular biology of brassinosteroids.

In the post-genomic era, science is still challenged to explain the biosynthesis of complex polysaccharides and glycoconjugates. Unlike nucleic acids and proteins, the information needed for their biosynthesis is not clearly contained to this day within the genome of the various organisms. This means that no biosynthetic code has been revealed yet. As a result, there will be millions of structurally distinct, functional chemical species at the end of their biosynthesis. This book offers an up-to-date view on sulfated polysaccharide structure and function state of the art in different life kingdoms: bacteria, protista, plantae, fungi and animalia. The structure, activities and current thinking on the interplay between these two vital features (as well as ways to study them) are reviewed in the present book. The growing economical interest in sulfated polysaccharides due to their potential biotechnological use in different areas, such as pharmaceutical and food industries, are also commented on. The information within the chapters adds to other prior available literature; the intention of the authors was to extend and further develop the discussions related to glycobiology.

The Practice of Medicinal Chemistry, Fourth Edition provides a practical and comprehensive overview of the daily issues facing pharmaceutical researchers and chemists. In addition to its thorough treatment of basic medicinal chemistry principles, this updated edition has been revised to provide new and expanded coverage of the latest technologies and approaches in drug discovery. With topics like high content screening, scoring, docking, binding free energy calculations, polypharmacology, QSAR, chemical collections and databases, and much more, this book is the go-to reference for all academic and pharmaceutical researchers who need a complete understanding of medicinal chemistry and its application to drug discovery and development. Includes updated and expanded material on systems biology, chemogenomics, computer-aided drug design, and other important recent advances in the field Incorporates extensive color figures, case studies, and practical examples to help users gain a further understanding of key concepts Provides high-quality content in a comprehensive manner, including contributions from international chapter authors to illustrate the global nature of medicinal chemistry and drug development research An image bank is available for instructors at www.textbooks.elsevier.com

Drugs and Nutrients

Human Cytosolic Sulfotransferases

Sulfation of Drugs & Related Compounds

Handbook of Glycosyltransferases and Related Genes

The Isolated hepatocyte

Metabolism of Functional Groups

Idiosyncratic drug reactions (IDRs), although rare, can be life-threatening. The patho-mechanisms of IDRs are unclear; however, reactive metabolites of drugs and the immune system are thought to be involved. For carboxylate drugs, their acyl glucuronide metabolites have been implicated as the mediators of the adverse effects; however, a direct link has yet to be established. For the carboxylate drug zomepirac (ZP), this study aimed to explore the sulfation pathway involving the conversion of the metabolite hydroxy-ZP to ZP 4-methylsulfate. The role of ZP 4-methylsulfate as a reactive metabolite was unclear, as it was not isolated and characterized, either synthetically or enzymatically. For the drug nevirapine (NVP), it was proposed that its metabolite 12-hydroxy-NVP is converted to NVP 12-sulfate, which could form a reactive iminoquinone. This project is still in progress, but with the help of the animal model, the role of the 12-hydroxy-NVP should be elucidated more clearly.

The existence of multiple sulfotransferases (SULTS) was first discovered in 1958. Since then, any attempts to create a comprehensive text dedicated to sulfation and sulfotransferases have been rare and, thanks to rapid advances in molecular biology and biochemistry, quickly outdated. However, those advances have permitted an accelerated understanding of human sulfotransferase activity and with it the creation of a growing database on sulfotransferases that, until now, has remained scattered in the literature. Human Cytosolic Sulfotransferases serves an important function by the mere feat of cu.

The Isolated Hepatocyte: Use in Toxicology and Xenobiotic Biotransformations covers the link between research on the isolated hepatocyte and the disciplines of cell culture, toxicology, metabolism, and molecular biology. This book is composed of 11 chapters and begins with an overview of the regulation of liver growth, sulfation, glucuronidation of xenobiotics in specific liver sites. The next chapters deal with toxicology studies in cultured hepatocytes from various species and the in vitro control of hepatocyte proliferation. These topics are followed by discussions of choices and methods of cytotoxicity measures; hepatoxicity of metals; the metabolism and toxicity of xenobiotics in a primary culture; and the mechanism of carcinogen-induced pleiotropic drug resistance in hepatocytes. The concluding chapters describe the in vivo and in vitro measurement of chemically-induced DNA repair in hepatocytes, as well as the genotoxicity studies with human hepatocytes. This book is intended primarily to toxicologists and researchers.

Glycosaminoglycans (GAGs) are a family of linear polysaccharides that are found in all animal tissues. Several are used as biomaterials, including heparin, heparin sulfate, keratan sulfate, dermatan sulfate, and chondroitin sulfate. This volume discusses the role of GAGs in development, health and disease. This series provides a forum for discussion of new discoveries, approaches, and ideas Contributions from leading scholars and industry experts Reference guide for researchers involved in molecular biology and related fields

The Medicinal Chemist's Guide to Solving ADMET Challenges

Sulfated Polysaccharides

Toxicology and Human Environments

Drug-like Properties: Concepts, Structure Design and Methods

Basic Concepts and Practice

Role of Genetic Polymorphisms

Humans have utilized the bioactive principles of different plants for various beneficial physiological properties including antimicrobial properties for many centuries. However, interests of using medicinal plants declined in the 20th century with the availability of effective synthetic antimicrobial drugs. The development of microbial resistance to various drugs has accelerated researc use of phytochemicals as alternatives to synthetic drugs in the recent years. This book presents an comprehensive reviews on the antimicrobial and antiviral properties of numerous recently reported phytochemicals, and their mechanisms of antimicrobial actions. Some of the chapters have critically discussed the beneficial and adverse effects of antibacterial, and stimulatory act phytochemicals on rumen microbial populations, and gut microbial populations of humans and animals. Microbial adaptation and resistance of microbes to phytochemicals has also been highlighted. On the applied apects, the use of phytochemicals against drug resistance microbes, to treat microbial diseases, for food preservation, to inhibit methanogenic archaea in the rumen, biohydrogenating microbial populations to increase conjugated linoleic acids in animal-derived foods have been presented in different chapters.

Sugar chains (glycans) are often attached to proteins and lipids and have multiple roles in the organization and function of all organisms. "Essentials of Glycobiology" describes their biogenesis and function and offers a useful gateway to the understanding of glycans.

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 refl 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 t 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

This book is a printed edition of the Special Issue "Glycosaminoglycans and Proteoglycans" that was published in Pharmaceuticals

Bioanalytical Separations

Heparanase

from ADME to Toxicity Optimization

Dietary Phytochemicals and Microbes

Mechanisms and New Antimicrobial Approaches

SULFATION of DRUGS and RELATED COMPOUNDS

This revised second edition covers the pharmacologic principles underlying the individualization of patient therapy and contemporary drug development, focusing on the fundamentals that underlie the clinical use and contemporary development of pharmaceuticals. Authors drawn from academia, the pharmaceutical industry and government agencies cover the spectrum of material, including pharmacokinetic practice questions, covered by the basic science section of the certifying examination offered by the American Board of Clinical Pharmacology. This unique reference is recommended by the Board as a study text and includes modules on drug discovery and development to assist students as well as practicing pharmacologists. Unique breadth of coverage ranging from drug discovery and development to individualization and quality assessment of drug therapy Unusual cohesive of presentation that stems from author participation in an ongoing popular NIH course Instructive linkage of pharmacokinetic theory and applications with provision of sample problems for self-study Wide-ranging perspective of authors drawn from the ranks of Federal agencies, academia and the pharmaceutical industry Expanded coverage of pharmacogenetics Expanded coverage of drug transporters and their role in interactions Inclusion of new material on enzyme induction mechanisms in chapters on drug metabolism and drug interactions A new chapter on drug discovery that focuses on oncologic agents Inclusion of therapeutic antibodies in chapter on biotechnology products

Metabolic Basis of Detoxication: Metabolism of Functional Groups considers the possible fates of the relatively circumscribed number of functional groups that xenobiotics bear. An understanding of the possible reactions, and the chemical and biological factors influencing them, will contribute to the overall predictability of the fate of "real" molecules. This approach attempts to knit together the understanding of metabolic pathways with that of the enzymes that catalyze the specific steps. The book contains 18 chapters and begins with a discussion of the biological oxidation of carbon atoms. This is followed by separate chapters on the metabolism of halogenated aliphatic hydrocarbons, aryl halides, heterocyclic rings, alcohols, aldehydes, and ketones. Subsequent chapters cover oxidative processes such as metabolic dealkylations and biological oxidation at nitrogen centers; the reduction of nitro and azo compounds and tertiary amine N-oxides; the oxidation, alkylation, acylation, and glycosylation of mercaptans; epoxide metabolism; and conjugation of phenols. The book aims to inform and interest the pharmacologist and toxicologist concerning the biochemical aspects and to orient the biochemist to the pharmacological insights required in dealing with the metabolism of xenobiotics.

Abstract: A state-of-the-art reference text for toxicologists, oncologists, nutritionists, and clinical investigators provides 15 technical reviews of various aspects of drug-nutrient interactions, organized into 2 parts. The first part is devoted to the effects of food and nutrient intake on the disposition of foreign compounds. The second part discusses research activities on the effects of drug on nutrition. Topics include the interpretation of serial or parallel studies of xenobiotics in dietary studies with test animals; the effect of nutrients on chemical carinogeneis; and the interpretation of aberrant effects of therapeutic drugs that may be accounted for by the effects of food on drug deposition or the effects of drug on nutritional status. Numerous data tables are presented throughout and reference citations are appended to each of the review papers. (wz).

The so-called postgenomic research era has now been launched, and the field of gly cobiology and glycotechnology has become one of the most important areas in life science because glycosylation is the most common post-translational modification reaction of proteins in vivo. On the basis of Swiss-Prot data, over 50% proteins are known to undergo glycosylation, but in fact the actual functions of most of the sugar chains in the glycoconjugates remain unknown. The complex carbohydrate chains of glycoproteins, glycolipids, and proteoglycans represent the secondary gene products formed through the reactions of glycosyl transferases. The regulation of the biosynthesis of sugar chains is under the control of the expression of glycosyltransferases, their substrate specificity, and their local ization in specific tissue sites. There is a growing body of evidence to suggest that these enzymes play pivotal roles in a variety of important cellular differentiation and developmental events, as well as in disease processes. Over 300 glycosyltransferases appear to exist in mammalian tissues. If the genes that have been purified and cloned from various species such as humans, cattle, pigs, rats and mice are counted as one, approximately 110 glycogenes that encode glycosyltransferases and related genes have been cloned at present, and this number continues to grow each day. However, most of the functions of the glycosyltransferase genes and related genes are unknown. This fact has stimulated numerous new and interesting approaches in molecular biologi cal investigations.

Evolution of Metabolic Pathways

Principles of Clinical Pharmacology

A Systemic Investigation of the Sulfation of Opioid Drugs by the Human Cytosolic Sulfotransferases (SULTs)

Glycosaminoglycans and Proteoglycans

Topics on Drug Metabolism

Cattle are a very important part of the human food chain. Administration of veterinary drugs and other xenobiotic compounds to cattle can often result in the accumulation of metabolic residues in edible tissues that can potentially affect humans through the food chain. An understanding of drug metabolism in this species is vital to ensure safe use of drugs in cattle and eventually the provision of safer animal derived food products to man. Sulfation catalysed by sulfotransferases (SULTs) is an important phase 2 drug metabolising reaction. It is not only involved in the detoxification of drugs and xenobiotics but also in the bioactivation of procarcinogens. It is also important in the metabolism of several drugs used routinely in cattle. However, very little work has been carried out on SULTs in cattle. A variety of in vitro tools are available to study drug metabolising enzymes (DMEs) like SULTs. These include tissue microsomes, cytosol, recombinant enzymes and isolated cells such as the hepatocytes. Recombinant SULTs are important tools that can be used for the study of isoform specific drug biotransformation, drug-drug interactions and the effect of genetic polymorphisms on the activity of specific isoforms. As the liver is the major drug metabolising organ in the body, it is essential to study expression and activity of cytosolic liver sulfotransferases. Hepatocytes contain DMEs and drug transporters along with all the necessary cofactors that represent in vivo conditions. This makes hepatocytes a better representative of in vivo conditions as compared to microsomes, cytosol or recombinant enzymes. In this study we have characterised sulfotransferases in cytosol, recombinant enzymes and hepatocytes. Antibodies previously raised against human sulfotransferase isoforms were used in the detection of cytosolic bovine sulfotransferases. Probe substrates established for activity with human SULTs were used for assessing the activity of recombinant and cytosolic bovine sulfotransferases. Cytosol was prepared from 8 male livers and 12 female livers (8 untreated and 4 treated with an exogenous progestin). SULT1B1, SULT1E1 and SULT2A1 were detected in bovine liver cytosol. Expression of SULT2A1 in the bovine liver was sex specific with males expressing almost twice as much SULT2A1 compared to the females. However, no activity was detected with dehydroepiandrosterone (DHEA) which is used as a probe substrate for SULT2A1 in humans. Pregnenolone is metabolised by SULT2A1 and SULT2B1 in humans. Activity towards this substrate was detected in the bovine liver, however no sex related differences in activity were observed. 4-nitrophenol liver, however no sex related differences in activity were observed. 4-nitrophenol is metabolised by several members of the SULT1 family in humans such as SULT1A1, SULT1B1 and SULT1C. 17ß-estradiol is a probe substrate for human SULT1E1. Activity was detected with 4-nitrophenol in male and female bovine livers. Male liver cytosol followed Michaelis-Menten kinetics whereas the female liver cytosol displayed partial substrate inhibition. This suggests that different enzymes have been involved in the biotransformation of 4-nitrophenol in the male and female liver. Activity towards 17ß-estradiol in the female liver was almost 4 times higher than in the male liver. Recombinant bovine sulfotransferases (SULT1A1, SULT1B1, SULT1E1 and SULT2A1) were expressed in E. coli. All bovine SULTs except SULT2A1 were expressed in the soluble fraction. Like human SULT1A1, bovine SULT1A1 also displayed partial substrate inhibition, however the extent of inhibition (as seen with the Ki values) was lower compared to human SULT1A1. Bovine SULT1B1 followed Michaelis-Menten kinetics with 4-nitrophenol. Substrate specificity profiling carried out with equal amounts of bovine SULT1A1 and SULT1B1 revealed that SULT1B1 was better at sulfating phenolic compounds as compared to bovine SULT1A1. SULT1A1 is highly expressed in the human liver and is the major enzyme involved in drug metabolism in the human liver. This might not be the case in cattle given that SULT1B1 was found to be better at sulfation than SULT1A1 and expression of SULT1A1 was not detected in the bovine liver using antibodies. Human SULT1E1 is known to metabolise 17ß-estradiol with a very high affinity and with a Km in the low nanomolar range. Comparatively, bovine SULT1E1 metabolised 17ß-estradiol with a lower affinity, in the micromolar range. Expression and activity of bovine sulfotransferases differed from human sulfotransferases and some of the differences could be attributed to key amino acid residue substitutions in the active site of the bovine SULTs. For example, substitution of Phe141 in human SULT1E1 to Leu141 in bovine SULT1E1 restricts the ability of bovine SULT1E1 to form strong van der Waals interactions with the substrate due to loss of an aromatic hydrocarbon ring. This could explain the reduced affinity of bovine SULT1E1 for 17ß-estradiol. Substitutions of small uncharged residues with large charged ones in the active site of bovine SULT2A1 could have unforeseeable effects that could result in the formation of an insoluble protein. Substitutions in the active site of bovine SULT1A1 that bind the second molecule of 4-nitrophenol could be responsible for the reduced partial substrate inhibition effects observed in comparison to human SULT1A1. In order to further validate some of these findings it would be necessary to perform additional experiments that involve mutating the substituted residue to the original one as found in the human/mouse counterpart and looking for restoration of original properties. The work was extended to investigate conjugative metabolism of the steroid hormone 17ß-estradiol and its stereoisomer 17a-estradiol in microsomes, cytosol and cryopreserved hepatocytes all prepared from bovine liver. It was found that glucuronidation was the main route for estradiol metabolism in cattle since large amount of glucuronide metabolites were detected in microsomes and cryopreserved hepatocytes. In comparison no sulfate metabolites were detected in cytosol and hepatocytes. We now have a better understanding of some of the important phase 2 drug metabolism pathways in cattle.

Due to that at present, the majority of diseases are associated with alterations in oxidative stress and inflammatory processes, and in that Nrf-2 is a modulator of these processes; knowing how this transcriptional factor functions and is regulated opens a therapeutic window to diverse diseases. Therefore, the efforts of various investigation groups are centered on finding activators and/or inhibitors of Nrf-2 to prevent or control diverse diseases, for example, cancer, where it would be important to regulate Nrf-2 in order for it to activate apoptosis pathways in cancerogenous cells, or in neurodegenerative diseases where cell death is predominant, it would be important for Nrf-2 to activate antiapoptotic pathways.

Advances in Cancer Research provides invaluable information on the exciting and fast-moving field of cancer research. Here, once again, outstanding and original reviews are presented on a variety of topics. Provides information on cancer research Outstanding and original reviews Suitable for researchers and students

Bioanalytical Separations is volume 4 of the multi-volume series, Handbook of Analytical Separations, providing reviews of analytical separation methods and techniques used for the determination of analytes across a whole range of applications. The theme for this volume is bioanalysis, in this case specifically meaning the analysis of drugs and their metabolites in biological fluids. - Discusses new developments in instrumentation and methods of analyzing drugs and their metabolites in biological fluids - Provides guidance to the different methods, their relative value to the user, and the advantages and pitfalls of their use - Future trends are identified, in terms of the potential impact of new technologies

A Master Regulator of Oxidative StressThe Transcription Factor Nrf2

Seaweed Polysaccharides

Volume 1: Molecular Toxicology

Essentials of Glycobiology

Use in Toxicology and Xenobiotic Biotransformations

Environmental Health Perspectives

Opioid drugs are of great importance in the management of acute and chronic pain conditions. They are recognized as being essential in the management of severe malignant and non-malignant pain. Pharmacokinetic differences among these drugs contribute to patients having differential responses, including bioavailability, metabolism, and elimination from the body. It is becoming more evident that genetics play a vital role in affecting the metabolism of opioid drugs. Three major enzyme systems, CYP450, UDP-glucuronosyltransferase (UGTs) and SULTs have been shown to be involved in their metabolism. Polymorphisms of these enzyme systems can result in an individual having distinct phenotypes: poor metabolizers which express two nonfunctional alleles, intermediate metabolizers at least one reduced functional allele, extensive metabolizers at least one functional allele, and ultra-rapid metabolizers express multiple copies of the functional allele. These genetic differences are partially explained by single nucleotide polymorphisms, (-SNPs), which encode for molecular entities involved in the pharmacodynamic and pharmacokinetic processes. Understanding how and to what degree the allozymes of different enzyme systems such as the CYPs, UGTs and SULTs affect drug metabolism can add new insights into gene therapy-based approaches and greatly improve the treatment of chronic pain. My thesis research was focused on the role of human SULTs in the metabolism of opioid drugs. Previous studies have demonstrated that of the eleven known SULTs, SULT1A3 was found to be involved in opioid drug metabolism. By carrying out in vitro assays, we first determined the sulfating activity of SULT1A3 toward opioid drugs and subsequently the effects of SNPs of human SULT1A3/SULT1A4 genes on the enzymatic characteristics of SULT1A3 allozymes in mediating hydromorphone and pentazocine, two commonly used opioid drugs. The results obtained provided valuable information relevant to the differential metabolism of hydromorphone and pentazocine in individuals having different SULT1A3/SULT1A4 genotypes.

Sulfation of Drugs & Related CompoundsCRC Press

A comprehensive guide to cutting-edge tools in ADME research The last decade has seen tremendous progress in the developmentof analytical techniques such as mass spectrometry and molecularbiology tools, resulting in important advances in drug discovery,particularly in the area of absorption, distribution, metabolism,and excretion (ADME). ADME-Enabling Technologies in Drug Design and Developmentfocuses on the current state of the art in the field, presenting acomprehensive review of the latest tools for generating ADME datain drug discovery. It examines the broadest possible range ofavailable technologies, giving readers the information they need tochoose the right tool for a given application, a key requisite forobtaining favorable results in a timely fashion for regulatoryfilings. With over thirty contributed chapters by an internationalteam of experts, the book provides: A thorough examination of current tools, covering bothelectronic/mechanical technologies and biologically based ones Coverage of applications for each technology, including keyparameters, optimal conditions for intended results, protocols, andcase studies Detailed discussion of emerging tools and techniques, from stemcells and genetically modified animal models to imagingtechnologies Numerous figures and diagrams throughout the text Scientists and researchers in drug metabolism, pharmacology,medicinal chemistry, pharmaceutics, toxicology, and bioanalyticalscience will find ADME-Enabling Technologies in Drug Design andDevelopment an invaluable guide to the entire drug developmentprocess, from discovery to regulatory issues.

Antibiotic Resistance: Mechanisms and New Antimicrobial Approaches discusses up-to-date knowledge in mechanisms of antibiotic resistance and all recent advances in fighting microbial resistance such as the applications of nanotechnology, plant products, bacteriophages, marine products, algae, insect-derived products, and other alternative methods that can be applied to fight bacterial infections. Understanding fundamental mechanisms of antibiotic resistance is a key step in the discovery of effective methods to cope with resistance. This book also discusses methods used to fight antibiotic-resistant infection based on a deep understanding of the mechanisms involved in the development of the resistance. Discusses methods used to fight antibiotic-resistant infection based on a deep understanding of mechanisms involved in the development of the resistance Provides information on modern methods used to fight antibiotic resistance Covers a wide range of alternative methods to fight bacterial resistance, offering the most complete information available Discusses both newly emerging trends and traditionally applied methods to fight antibiotic resistant infections in light of recent scientific developments Offers the most up-to-date information in fighting antibiotic resistance Includes involvement of contributors all across the world, presenting questions of interest to readers of both developed and developing countries

From Basic Research to Clinical Applications

Isolation, Biological and Biomedical Applications

Sulfation of Phenolic Drugs

Conjugation□Deconjugation Reactions in Drug Metabolism and Toxicity

Characterisation of the Sulfotransferases Catalysing the Sulfation of Xenobiotics and Steroids in Bovine Liver

Bioactivation Involving the Sulfation Pathway

The essentials of drug metabolism vital to developing new therapeutic entities Information on the metabolism and disposition of candidate drugs is a critical part of all aspects of the drug discovery and development process. Drug metabolism, as practiced in the pharmaceutical industry today, is a complex, multidisciplinary field that requires knowledge of sophisticated analytical technologies and expertise in mechanistic and kinetic enzymology, organic reaction mechanism, pharmacokinetic analysis, animal physiology, basic chemical toxicology, preclinical pharmacology, and molecular biology. With chapters contributed by experts in their specific areas, this reference covers: * Basic concepts of drug metabolism * The role of drug metabolism in the pharmaceutical industry * Analytical techniques in drug metabolism * Common experimental approaches and protocols Drug Metabolism in Drug Design and Development emphasizes practical considerations such as the data needed, the experiments and analytical methods typically employed, and the interpretation and application of data. Chapters highlight facts, common protocols, detailed experimental designs, applications, and limitations of techniques. This is a comprehensive, hands-on reference for drug metabolism researchers as well as other professionals involved in pre-clinical drug discovery and development.

Molecular Toxicology is the first volume of a three-volume set Molecular, Clinical and Environmental Toxicology that offers a comprehensive and in-depth response to the increasing importance and abundance of chemicals in daily life. By providing intriguing insights far down to the molecular level, this work covers the entire range of modern toxicology with special emphasis on recent developments and achievements. It is written for students and professionals in medicine, science, public health and engineering who are demanding reliable information on toxic or potentially harmful agents and their adverse effects on the human body.

Seaweed Polysaccharides: Isolation, Biological, and Biomedical Applications examines the isolation and characterization of algal biopolymers, including a range of new biological and biomedical applications. In recent years, significant developments have been made in algae-based polymers (commonly called polysaccharides), and in biomedical applications such as drug delivery, wound dressings, and tissue engineering. Demand for algae-based polymers is increasing and represent a potential—very inexpensive—resource for these applications. The structure and chemical modification of algal polymers are covered, as well as the biological properties of these materials – including antithrombic, anti-inflammatory, anticoagulant, and antiviral aspects. Toxicity of algal biopolymers is also covered. Finally, the book introduces and explains real world applications of algal-based biopolymers in biomedical applications, including tissue engineering, drug delivery, and biosensors. This is the first book to cover the extraction techniques, biomedical applications, and the economic perspective of seaweed polysaccharides. It is an essential text for researchers and industry professionals looking to work with this renewable resource. Provides comprehensive coverage of the research currently taking place in biomedical applications of algae biopolymers Includes practical guidance on the isolation, extraction, and characterization of polysaccharides from sustainable marine sources Covers the extraction techniques, biomedical applications, and economic outlook of seaweed polysaccharides

The aim of this text is to examine the physiological development of the fetus. It allows the reader to study the unique pharmacokinetic and metabolic features of newborns and gives specific examples of drug metabolism in the newborn. The purpose of this book is to enhance the current knowledge of pharmacology of the newborn by observing the embryo and placenta in normal and abnormal development, placental transfer of drugs, metabolic pathways, and metabolism of specific drugs such as theophylline, benzodiazepines, and antibiotics. This is a useful book for those involved in pediatric research, pharmacology, toxicology, experimental therapeutics and biology.

The Organic Chemistry of Drug Design and Drug Action

The Interactive Effects

Metabolic Basis of Detoxication

Zomepirac and Nevirapine

Drug Toxicity and Metabolism in Pediatrics

Xenobiotica

The Medicinal Chemist's Guide to Solving ADMET Challenges summarizes a series of design strategies and tactics that have been successfully employed across pharmaceutical and academic laboratories to solve common ADMET issues. These are exemplified with a curated collection of concrete examples displayed in a highly visual "table-of-contents" style format, allowing readers to rapidly identify the most promising approaches applicable to their own challenges. Each ADMET parameter is introduced in a concise yet comprehensive manner and includes background, relevance and screening strategies. Medicinal chemistry knowledge of how best to modify molecular structure to solve ADMET issues is challenging to retrieve from the literature, public databases and even corporate data warehouses. The Medicinal Chemist's Guide to Solving ADMET Challenges addresses this gap by presenting state-of-the-art design strategies put together by a global group of experienced medicinal chemists and ADMET experts across academia and the pharmaceutical industry.

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.

EHP.

Phenolsulfotransferase in Mental Health Research

Molecular, Clinical and Environmental Toxicology

Antibiotic Resistance