Heterocycles In Drugs And Drug Discovery

Scope of Selective Heterocycles from Organic and Pharmaceutical Perspective is a compilation of bioactive-chosen heterocyclic scaffolds intended for postgraduates, research scholars, pharmaceutical scientists, and others interested in an appreciation of the title subject. It is an edited book and is not comprehensive as well in the mentioned field. Few synthetic strategies along with bioactivity are presented, and some limitations were raised in order to arouse curiosity of the reader.

The heterocycles are the largest group of organic compounds and this monograph represents a comprehensive survey of this vast field. The discussion is backed by numerous lucid diagrams while the extensive reaction schemes are supported by pertinent references. The text treats aromatic and nonaromatic heterocycles according to ring size under six defined headings for easy location and comparison, and also includes natural occurrence, synthetic aspects and applications in the chemical and pharmaceutical industries. An invaluable reference for advanced undergraduate and graduate students of chemistry and related subjects, this is equally an important aid to professional chemists and teachers of chemistry. Belongs on the shelf of every university library and in laboratories dealing with any aspect of heterocyclic chemistry.

With contributions by numerous experts

Presents a comprehensive account of established protecting-group-free synthetic routes to molecules of medium to high complexity This book supports synthetic chemists in the design of strategies, which avoid or minimize the use of protecting groups so as to come closer to achieving an “ideal synthesis” and back the global need of practicing green chemistry. The only resource of its kind to focus entirely on protecting-group-free synthesis, it is edited by a leading practitioner in the field, and features enlightening contributions by top experts and researchers from across the globe. The introductory chapter includes a concise review of historical developments, and discusses the concepts, need for, and future prospects of protecting-group-free synthesis. Following this, the book presents information on protecting-group-free synthesis of complex natural products and analogues, heterocycles, drugs, and related pharmaceuticals. Later chapters discuss practicing protecting-group-free synthesis using carbohydrates and of glycosyl derivatives, glycol-polymers and glyco-conjugates. The book concludes with a chapter on latent functionality as a tactic toward formal protecting-group-free synthesis. A comprehensive account of established protecting-group-free (PGF) synthetic routes to molecules of medium to high complexity Benefits total synthesis, methodology development and drug synthesis researchers Supports synthetic chemists in the design of strategies, which avoid or minimize the use of protecting groups so as to come closer to achieving an “ideal synthesis” and support the global need of practicing green chemistry Covers a topic that is gaining importance because it renders syntheses more economical Protecting-Group-Free Organic Synthesis: Improving Economy and Efficiency is an important book for academic researchers in synthetic organic chemistry, green chemistry, medicinal and pharmaceutical chemistry, biochemistry, and drug discovery.

Halogenated Heterocycles

Volume 1

Privileged Scaffolds in Medicinal Chemistry

from ADME to Toxicity Optimization

Volume 1: Advanced Synthetic Techniques

Piperidine-Based Drug Discovery

Presents a wide-ranging overview of essential topics and recent advances in MCR chemistry Heterocycles are a central component in natural product chemistry, pharmaceuticals, agrochemicals, and material science. New synthetic methodologies integrating the sequencing of multicomponent reactions (MCRs) are today being used for the rapid synthesis of diversified heterocycles in just one step. Multicomponent Reactions towards Heterocycles presents an up-to-date summary MCR chemistry with a focus on the conjugation between modern synthetic methodologies and MCRs. Featuring contributions by leaders in the field, this comprehensive resource highlights applications of MCRs in natural products and intermediate synthesis, discusses current trends and future prospects in MCR chemistry, outlines novel multicomponent procedures, and more. The authors provide the practical information required for designing new reaction strategies and mechanisms, covering topics including MCR-based green synthetic methods, cyclization and cycloaddition reactions, heterocycle multicomponent syntheses in a continuous flow, catalytic alkynoyl generation, MCR synthesis of saturated heterocycles, and C–H functionalization and multicomponent reactions. Provides a thorough overview of heterocycles as input in multicomponent reactions Discusses recent advances in the field of MCR chemistry and progress in the synthesis and functionalization of heterocycles Demonstrates the use of MCRs to simplify synthetic design and achieve complexity and diversity in novel bioactive molecules Highlights examples of multicomponent polymerizations, target-oriented synthesis, and applications of MCR in medicinal chemistry Explains the methodology of using on-resin MCRs to produce heterocycle compounds Illustrating the key role of MCRs towards heterocycles in natural product synthesis, drug discovery, organic synthesis, and other applications, Multicomponent Reactions towards Heterocycles is required reading for synthetic chemists in academia and industry alike.

The number of available synthetic methods can be overwhelming. In order to create novel motifs and templates which confer new and potentially valuable drug-like properties, it is important to know which synthetic methodologies will give the best results. Similarly, which methodologies are used to progress potential drug candidates from leads through the development process? What are the current industrial research problems and how can they be resolved in an industrial setting? This book highlights key methods that have real impact in drug discovery and facilitate delivery of drug molecules. Synthetic Methods in Drug Discovery Volume 1 focuses on the hugely important area of transition metal mediated methods used in industry. Current methods of importance such as the Suzuki-Miyaura coupling, Buchwald-Hartwig couplings and CH activation are discussed. In addition, exciting emerging areas such as decarboxylative coupling, and the uses of iron and nickel in coupling reactions are also covered. This book provides both academic and industrial perspectives on some key reactions giving the reader an excellent overview of the techniques used in modern synthesis. Reaction types are conveniently framed in the context of their value to industry and the challenges and limitations of methodologies are discussed with relevant illustrative examples. Edited and authored by leading scientists from both academia and industry, this book will be a valuable reference for all chemists involved in drug discovery as well as postgraduate students in medicinal chemistry.

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.

This book examines and evaluates the strategies utilized to design and synthesize pharmaceutically active agents. Significant updates over the last 10 years since the publication of the 1st edition include synthesis of enantiomerically pure isomers, novel chemical methodologies, and new pharmaceutical agents targeted at novel biological endpoints. Written by an experienced successful author, this book meets the needs of a growing community of researchers in pharmaceutical R &D, as well as medical professionals, by providing a useful guide for designing and synthesizing pharmaceutical agents. Additionally, it is a useful text for medicinal chemistry students.

Synthesis and Biological Activities

The Organic Chemistry of Drug Synthesis

Green Synthesis of Heterocycles

Green Approaches in Medicinal Chemistry for Sustainable Drug Design

Promising Drug Molecules of Natural Origin

Multicomponent Reactions towards Heterocycles

Applications of Heterocycles in the Design of Drugs and Agricultural ProductsAcademic Press

The Book Principles Of Organic Medicinal Chemistry Describes The Principles And Concepts Of Chemistry, Synthetic Schemes, Structure Activity Relationships, Mechanism Of Action And Clinical Uses Of Carbon Compounds In The Light Of Modern Trends. The Book Covers The Syllabai Of B. Pharmacy And M.Pharmacy Courses Of All Indian Universities.This Book Comprises Of 22 Chapters. Chapter 1 Gives An Introduction To Medicinal Chemistry, Chapter 2 Explain About The Basics On Principles Of Drug Action And Physicochemical Properties Of Organic Medicinal, Substances Are Elaborated In Chapter 3. The Concepts Of Prodrugs And Drug Metabolism Are Summarized In Chapter 4 And Chapter 5 Respectively. Chapter 6 To Chapter 22 Explains Chemistry, Properties, Mechanism Of Action, Structure Activity Relationships, Chemistry Of Newer Drugs And Clinical Uses Of Various Therapeutic Agents. At The End Of Book, A Set Of More Than 200 Essays And Short Questions And 225 Objective Questions With Answers Are St Strategically Designed.

Green Synthetic Approaches for Biologically Relevant Heterocycles, Second Edition, Volume One: Advanced Synthetic Techniques reviews this significant group of organic compounds within the context of sustainable methods and processes, expanding on the first edition with fully updated coverage and a whole range of new chapters. Volume One explores advanced synthetic techniques, with each chapter presenting in-depth coverage of various green protocols for the synthesis of a wide variety of bioactive heterocycles that are classified on the basis of ring-size and/or the presence of heteroatoms. Techniques covered range from high pressure cycloaddition reactions and microwave irradiation to sustainable one-pot domino reactions. This updated edition is an essential resource on sustainable approaches for academic researchers, R&D professionals, and students working across medicinal, organic, natural product and green chemistry. Provides fully updated coverage of the field of greener heterocycle synthesis Includes new chapters on varied multicomponent reactions, alongside both traditional and novel approaches Presents information in an accessible style with an emphasis on sustainability

G. Sandford: Perfluoroheteroaromatic Chemistry: Multifunctional Systems from Perfluorinated Heterocycles by Nucleophilic Aromatic Substitution Processes.- A. A. Gakh: Monofluorinated Heterocycles.- R. Dembinski ? Y. Li ? D. Gundapuneni ? A. Decker: Synthesis of beta-Halofurans.- Y. Shermolovich ? S. Pazenok: Synthesis of halogenated 5- and 6-membered sulfur- and Sulfur, Nitrogen Containing Heterocycles.- S. Minakata ? Y. Takeda ? J. Hayakawa: Heterocyclic Reagents Containing Nitrogen-Halogen Bond: Recent Applications.- Michael Schnürch: Recent Progress on the Halogen Dance Reaction on Heterocycles.- T. Kosjek ? E. Heath: Halogenated Heterocycles as Pharmaceuticals.- E. Heath ? T. Kosjek: Sources, Occurrence and Fate of Halogenated Heterocyclic Pharmaceuticals in the Environment.- J. Iskra: Green Methods in Halogenation of Heterocycles.

Design, Synthesis, Evaluation

Key Heterocycle Cores for Designing Multitargeting Molecules

Protecting-Group-Free Organic Synthesis

From Natural Products to Drug Discovery

Fluorinated Heterocycles

Reaction Mechanisms and Experimental Procedures in Medicinal Chemistry

Medicinal Chemistry of Anticancer Drugs, Second Edition, provides an updated treatment from the point of view of medicinal chemistry and drug design, focusing on the mechanism of action of antitumor drugs from the molecular level, and on the relationship between chemical structure and chemical and biochemical reactivity of antitumor agents. Antitumor chemotherapy is a very active field of research, and a huge amount of information on the topic is generated every year. Cytotoxic chemotherapy is gradually being supplemented by a new generation of drugs that recognize specific targets on the surface or inside cancer cells, and resistance to antitumor drugs continues to be investigated. While these therapies are in their infancy, they hold promise of more effective therapies with fewer side effects. Although many books are available that deal with clinical aspects of cancer chemotherapy, this book provides a sorely needed update from the point of view of medicinal chemistry and drug design. Presents information in a clear and concise way using a large number of figures Historical background provides insights on how the process of drug discovery in the anticancer field has evolved Extensive references to primary literature

Enables researchers to fully realize the potential to discover new pharmaceuticals among heterocyclic compounds Integrating heterocyclic chemistry and drug discovery, this innovative text enables readers to understand how and why these two fields go hand in hand in the effective practice of medicinal chemistry. Contributions from international leaders in the field review more than 100 years of findings, explaining their relevance to contemporary drug discovery practice. Moreover, these authors have provided plenty of practical guidance and tips based on their own academic and industrial laboratory experience, helping readers avoid common pitfalls. Heterocyclic Chemistry in Drug Discovery is ideal for readers who want to fully realize the almost limitless potential to discover new and effective pharmaceuticals among heterocyclic compounds, the largest and most varied family of organic compounds. The book features: Several case studies illustrating the role and application of 3, 4, 5, and 6+ heterocyclic ring systems in drug discovery Step-by-step descriptions of synthetic methods and practical techniques Examination of the physical properties for each heterocycle, including NMR data and quantum calculations Detailed explanations of the complexity and intricacies of reactivity and stability for each class of heterocycles Heterocyclic Chemistry in Drug Discovery is recommended as a textbook for organic and medicinal chemistry courses, particularly those emphasizing heterocyclic chemistry. The text also serves as a guide for medicinal and process chemists in the pharmaceutical industry, offering them new insights and new paths to explore for effective drug discovery.

Key Heterocycle Cores for Designing Multitargeting Molecules provides a helpful overview of current developments in the field. Following a detailed introduction to the manipulation of heterocycle cores for the development of dual or multitargeting molecules, the book goes on to describe specific examples of such developments, focusing on compounds such as Benzimidazole, Acridine, Flavones, Thiazolidinedione and Oxazoline. Drawing on the latest developments in the field, this volume provides a valuable guide to current approaches in the design and development of molecules capable of acting on multiple targets. Adapting the heterocyclic core of a single-target molecule can facilitate its development into an agent capable of acting on multiple targets. Such multi-targeting drugs have the potential to become essential components in the design of novel, holistic treatment plans for complex diseases, making the design of such active agents an increasingly important area of research. Emphasizes the chemical development of heterocyclic nuclei, from single to multitargeting molecules Provides chapter-by-chapter coverage of the key heterocyclic compounds used in synthesizing multitargeting agents Outlines current trends and future developments in multitarget molecule design for the treatment of various diseases

Pyrazole-Based Drug Discovery outlines the complexities of the pyrazole scaffold use in drug discovery, including derivative chemistry, structural properties, methods of synthesis and practical implementations. Designed as a guide for both experts and students working in this and related areas, this volume will facilitate the continued design and development of novel pharmaceuticals based on pyrazole and its derivatives. Heterocyclic compounds are of central importance to medicinal chemistry, as demonstrated by the high percentage of marketable drugs that feature heterocyclic fragments in their structures. As starting points for drug discovery they offer a broad range of attractive properties, and a detailed understanding of the particular characteristics of each is of great benefit to researchers. Pyrazole is a novel heterocycle with anti-fungal, antimicrobial, anti-tubercular, and antipsychotic pharmacological activities, proving to be a promising agent for medicinal chemists to synthesize various new chemical entities with desired biological activities. This book is ideal for researchers working in organic and medicinal chemistry both in academia and industry. Explores this extremely important heterocycle in a high level of detail Describes synthesis methods for current drugs based on pyrazole scaffolds Gives drug designers all the key knowledge required to develop new drugs utilizing pyrazole Provides pharmacologists a solid overview of the chemical background of existing pyrazole-based drugs

Impact of Chemical Building Blocks on ADMET

Medicinal Chemistry of Anticancer Drugs

Organic Chemistry Concepts and Applications for Medicinal Chemistry

An Introduction to Heterocyclic Chemistry and Biochemistry and the Role of Heterocycles in Science, Technology, Medicine and Agriculture

Applications of Transition Metal Catalysis in Drug Discovery and Development

Heterocycles

This volume is devoted to compounds in which the spiro centre is part of a pyranoid or furanoid or an iminosugar ring. The chapters contributed deal with methodological peculiarities of syntheses of natural and artificial sugar derived spirocycles as well as their biological applications and other utilities including marketed drugs. Carbohydrates are ubiquitous molecules in nature and participate in a vast number of biological interactions. Especially their conjugates with practically all kinds of primary and secondary metabolic small molecules (and also biomacromolecules) representing valuable tools for glycobiology research and also lead compounds for drug discovery. While monosaccharides per se appear as heterocycles, their natural conjugates frequently exhibit spiro(hetero)cyclic derivatives, in many cases of high therapeutical relevance. As a consequence, the field of carbohydrate-spiro-heterocycles attracts intense interest from both chemical and biomedical aspects therefore this volume will be of interest for synthetic and medicinal chemists and (glyco)biologists, as well as researchers involved in various biomedical fields.

One strategy to expedite the discovery of new drugs, a process that is somewhat slow and serendipitous, is the identification and use of privileged scaffolds. This book covers the history of the discovery and use of privileged scaffolds and addresses the various classes of these important molecular fragments. The first of the benzodiazepines, a class of drugs that is powerful for treating anxiety, may not have been discovered had it not been for a chance experiment on the contents of a discarded flask found during a lab clean-up. Some years later, scientists discovered that benzodiazepine derivatives were also effective in treating other diseases. This class of molecules was the first to be described as privileged in the sense that it is especially effective at altering the course of disease. Other privileged molecular structures have since been discovered, and since these compounds are so effective at interacting with numerous classes of proteins, they may be an effective starting point to look for new drugs against the supposedly "undruggable" proteins. Following introductory chapters presenting an overview, a historical perspective and the theoretical background and findings, main chapters describe the structure of privileged structures in turn and discuss major drug classes associated with them and their syntheses. This book provides comprehensive coverage of the subject through chapters contributed by expert authors from both academia and industry and will be an excellent reference source for medicinal chemists of a range of disciplines and experiences.

Until now, the area of drug metabolism and pharmacokinetics has been lacking in texts written for the Medicinal Chemist. This outstanding book, aimed at postgraduate medicinal chemists and those working in industry, fills this gap in the literature. Written by medicinal chemists and ADMET scientists with a combined experience of around 300 years, this aid to discovering drugs addresses the absorption, distribution, metabolism, excretion and toxicity (ADMET) issues associated with drugs. The book starts by describing drug targets and their structural motifs before moving on to explain ADMET for the medicinal chemist. It is the functional groups which most profoundly influence the drug molecules of which they form a part. They characterise the pharmacology, are essential to the activity, and alter the ADMET characteristics of each drug. Their effects follow a pattern, thus allowing medicinal chemists to predict and overcome potential challenges. For this reason, the Editors have taken the unique approach of dividing the remainder of the book into chapters which each focus on a different functional group. They describe drugs containing the functional group under consideration, explain why the group is there, and outline its physicochemical properties before going on to detail the ADMET issues. Where possible, prodrugs and bioisosteres, which may give alternative ADMET outcomes, are described. The chapters cross refer where similar matters are covered but individual chapters can be used in a stand alone manner. The book ends with a discussion of future targets and chemistry needs.

Heterocycles in Life and Society is an introduction to the chemistry of heterocyclic compounds, focusing on their origin and occurrence in nature, biochemical significance and wide range of applications. Written in a readable and accessible style, the book takes a multidisciplinary approach to this extremely important area of organic chemistry. Topics covered include an introduction to the structure and properties of heterocycles; the key role of heterocycles in important life processes such as the transfer of hereditary information, how enzymes function, the storage and transport of bioenergy, and photosynthesis; applications of heterocycles in medicine, agriculture and industry; heterocycles in supramolecular chemistry; the origin of heterocycles on primordial Earth; and how heterocycles can help us solve 21st century challenges. For this second edition, Heterocycles in Life and Society has been completely revised and expanded, drawing on a decade of innovation in heterocyclic chemistry. The new edition includes discussions of the role of heterocycles in nanochemistry, green chemistry, combinatorial chemistry, molecular devices and sensors, and supramolecular chemistry.

Impressive achievements include the creation of various molecular devices, the recording and storage of information, the preparation of new organic conductors, and new effective drugs and pesticides with heterocyclic structures. Much new light has been thrown on various life processes, while the chemistry of heterocycles has expanded to include new types of heterocyclic structures and reactions, and the use of heterocyclic molecules as ionic liquids and proton sponges. Heterocycles in Life and Society is an essential guide to this important field for students and researchers in chemistry, biochemistry, and drug discovery, and scientists at all levels wishing to expand their scientific horizon.

Strategies for Organic Drug Synthesis and Design

Carbohydrate-spiro-heterocycles

Bioactive Heterocycles II

Applications of Heterocycles in the Design of Drugs and Agricultural Products

Vicinal Diaryl Substituted Heterocycles

Medicinal Chemistry of Neglected and Tropical Diseases

Azoles are a broad and promising class of five-membered heterocyclic compounds containing from one up to five nitrogen atom(s) that can also contain sulfur or oxygen atoms. Widely used as potent antifungal agents, various azole derivatives have also demonstrated many other promising biological properties. This book covers studies of several types of thiazole-based heterocyclic scaffolds, the development of 4-thiazolidinone and thiazole derivatives with heterocyclic fragments as potential candidates for new drugs against trypanosomiasis, numerous synthetic approaches for the synthesis of 1,2,3-triazoles, the application of N-azole, N,S-azole, and N,O-azole as well as their derivatives as retarders of metallic corrosion, and the integration of azoles in materials used for renewable energy processing and applications and wood treatment.

Vicinal Diaryl-Substituted Heterocycles: A Gold Mine for the Discovery of Novel Therapeutic Agents draws together all of the key information about these compounds in one place for the first time. Following an informative overview of the importance of these structures to the discovery of potential therapeutic agents, the text goes on to outline the main compound types, with each chapter focusing on the activities of a different structure. Designed to support researchers by consolidating this important information in a single, practical guide, the authors hope to encourage further advancement and development in the discovery of novel therapeutic agents. As flexible building blocks for the production of novel compounds, vicinal diaryl-substituted heterocycles are a rich source of leads for the development of new drugs. Their adaptability means that they can be used to produce structures with a broad range of attractive characteristics, and a large number of vicinal diaryl-substituted heterocyclic compounds have already been synthesized and investigated by medicinal chemists as promising lead molecules. Collects together details of the key vicinal diaryl-substituted heterocyclic compounds in one place for the first time Highlights biological activities and SAR of derivatives Structured practically for ease of navigation between different derivatives

"Based on a symposium held at the fall 2006 meeting of the American Chemical Society in San Francisco, California"--Pref.

Metal and Nonmetal Assisted Synthesis of Six-Membered Heterocycles provides a useful guide to key approaches being explored in this area. The volume highlights synthetic approaches and catalytic options that facilitate the construction of multiple substituted molecules under mild conditions from easily available starting substrates. Drawing on the experience of its expert author, the book is a useful guide on the key approaches being explored in this area. Following a user-friendly structure based on specific six-membered heterocycle ring groups, this volume highlights synthetic approaches and catalytic options that facilitate the construction of multiple substituted molecules under mild conditions from easily available starting substrates. Highlights new methodologies for the synthesis of different six-membered heterocycles Provides an up-to-date overview of this fast-moving field with an easy-to-use structure Includes novel approaches used in the study and application of catalysts in synthetic organic reactions

Synthesis, Properties, Applications and Perspectives

Heterocycles in Life and Society

Principles of Organic Medicinal Chemistry

Green Synthetic Approaches for Biologically Relevant Heterocycles

Synthesis, Application and Environment

Metal and Nonmetal Assisted Synthesis of Six-Membered Heterocycles

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

An indispensable guide for all synthetic chemists who want to learn about the most relevant reactions and reagents employed to synthesize important heterocycles and drugs! The synthesis of natural products, bioactive compounds, pharmaceuticals, and drugs is of fundamental interest in modern organic chemistry. New reagents and reaction methods towards these molecules are being constantly developed. By understanding the mechanisms involved and scope and limitations of each reaction applied, organic chemists can further improve existing reaction protocols and develop novel efficient synthetic routes towards frequently used drugs, such as Aspirin or Penicillin. Applied Organic Chemistry provides a summary of important (name) reactions and reagents applied in modern organic chemistry and drug synthesis. It covers rearrangement, condensation, olefination, metathesis, aromatic electrophilic substitutions, Pd-catalyzed C-C bond forming reactions, multi-component reactions, as well as oxidations and reductions. Each chapter is clearly structured, providing valuable information on reaction details, step-by-step mechanism, experimental procedures, applications, and (patent) references. By providing mechanistic information and representative experimental procedures, this book is an indispensable guide for researchers and professionals in organic chemistry, natural product synthesis, pharmaceutical, and medicinal chemistry, as well as post-graduates preparing themselves for a job in the pharmaceutical industry. Hot Topic: Reviews important classes of organic reactions (incl. name reactions) and reagents in medicinal chemistry. Useful: Provides information on reaction details, common reagents, and functional group transformations used to synthesize natural products, bioactive compounds, drugs, and pharmaceuticals, e.g. Aspirin, Penicillin. Unique: For every reaction the mechanism is explained step by step, and representative experimental procedures are given, unlike most books in this area. User-friendly: Chapters are clearly structured making it easy for the reader to compare different reactions. Applied Organic Chemistry is an indispensable guide for researchers and professionals in organic chemistry, natural product synthesis, pharmaceutical, and medicinal chemistry, as well as post-graduates preparing themselves for a job in the pharmaceutical industry.

Organic Chemistry Concepts and Applications for Medicinal Chemistry provides a valuable refresher for understanding the relationship between chemical bonding and those molecular properties that help to determine medicinal activity. This book explores the basic aspects of structural organic chemistry without going into the various classes of reactions. Two medicinal chemistry concepts are also introduced: partition coefficients and the nomenclature of cyclic and polycyclic ring systems that comprise a large number of drug molecules. Given the systematic name of a drug, the reader is guided through the process of drawing an accurate chemical structure. By emphasizing the relationship between structure and properties, this book gives readers the connections to more fully comprehend, retain, apply, and build upon their organic chemistry background in further chemistry study, practice, and exams. Focused approach to review those organic chemistry concepts that are most important for medicinal chemistry practice and understanding Accessible content to refresh the reader's knowledge of bonding, structure, functional groups, stereochemistry, and more Appropriate level of coverage for students in organic chemistry, medicinal chemistry, and related areas; individuals seeking content review for graduate and medical courses and exams; pharmaceutical patent attorneys; and chemists and scientists requiring a review of pertinent material

Medicinal Chemistry of Neglected and Tropical Diseases: Advances in the Design and Synthesis of Antimicrobial Agents consolidates and describes modern drug discovery and development approaches currently employed to identify effective chemotherapeutic agents for the treatment of Neglected Tropical Diseases (NTDs) from a medicinal chemistry perspective. Chapters are designed to cater to the needs of medicinal chemists who work with chemotherapeutic developments for NTDs, as well as serve as a guide to budding medicinal chemists who wish to work in this area. It will introduce rational drug design approaches adopted in designing chemotherapeutics and validated targets available for the purpose.

Imidazole-Based Drug Discovery

A Gold Mine for the Discovery of Novel Therapeutic Agents

Concepts and Applications

The Medicinal Chemist's Guide to Solving ADMET Challenges

An Industrial Perspective

Imidazole-Based Drug Discovery covers all categories of imidazole and its derivatives, synthesis, pharmacological applications and drug-based studies. Imidazole scaffolds act as a channel between organic synthesis and medicinal chemistry and compel researchers to explore new drug candidates. This book provides detailed coverage of several greener synthetic protocols and pharmacological applications of imidazole derivatives that are useful to researchers working on designing more promising clinical lead compounds with this scaffold. It also includes information on past decades of research on the synthesis and biological applications of imidazole derivatives. This is an ideal resource for researchers in organic chemistry both in academic and industrial settings, as well as postgraduates in chemistry and medicinal chemistry. Reviews the most current developments and future perspectives of imidazole on different disease therapies to achieve the ultimate goal of disease eradication Discusses the role of imidazole in contemporary science, technological innovation, drug development, critical challenges and future research directions Covers emerging trends on different eco-benign pathways to synthesize imidazole derivatives for the development of simpler synthetic protocols

This new volume, Promising Drug Molecules of Natural Origin, explores potential beneficial drug substances derived from nature. It presents the general principles, characteristics, evaluation techniques, and applications involved in drug molecules from natural sources, such as plants and marine life. With chapters from renowned experts from around the world, the chapters in this volume address the challenges of standardization of herbal medicines, methods of characterization of natural medicines and phyto-constituents, and quality control methods for herbal medicines. Several chapters in the book focus on the evolution of phyto-constituents in cancer therapeutics, while others deal with applications for other diseases, such as diabetes and neuroinflammatory disorders. The volume also specifically reviews heterocyclic drugs from plants. This volume will be a valuable resource for faculty and advanced students in pharmaceutics as well as researchers, scientists, and industry professionals in medicine and drug development.

The classic reference on the synthesis of medicinal agents -- now completely updated The seventh volume in the definitive series that provides a quick yet thorough overview of the synthetic routes used to access specific classesof therapeutic agents, this volume covers approximately 220 new non-proprietary drug entities introduced since the publication of Volume 6. Many of these compounds represent novel structural types firstidentified by sophisticated new cell-based assays. Specifically, a significant number of new antineoplastic and antiviral agents are covered. As in the previous volumes, materials are organized by chemical class and syntheses originate with available starting materials. Organized to make the information accessible, this resource covers disease state, rationale for method of drug therapy, and the biological activities of each compound and preparation. The Organic Chemistry of Drug Synthesis, Volume 7 is a hands-on reference for medicinal and organic chemists, and a great resource for graduate and advanced undergraduate students in organic and medicinal chemistry.

*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*

Applied Organic Chemistry

Structure, Reactions, Syntheses and Applications

The Chemistry of Heterocycles

Azoles

Drug-like Properties: Concepts, Structure Design and Methods

Improving Economy and Efficiency

Piperidine-Based Drug Discovery outlines the complexities of Piperidine scaffold use in drug discovery, including derivative chemistry, structural properties, methods of synthesis and practical implementations. Piperidine scaffolds are the cornerstones of over 70 commercialized drugs (including multiple blockbusters). Designed as a guide for both experts and students working in this and related areas, it is hoped that this volume will encourage and inspire the continued design and development of novel pharmaceuticals based on Piperidine and its derivatives. Heterocyclic compounds are of central importance to medicinal chemistry, as demonstrated by the high percentage of marketable drugs that feature heterocyclic fragments in their structures. As starting points for drug discovery they offer a broad range of attractive properties, and a detailed understanding of the particular characteristics of each is of great benefit to researchers. The most commonly used heterocycle among US FDA approved pharmaceuticals, Piperidine is an extremely important building block in the synthesis of medicinal agents. This heterocycle and its derivatives exhibit a number of important functionalities and have been employed variously as CNS modulators, antiaggregants, anticoagulants, antihistamines, anti-cancer drugs and analgesics. Explores this extremely important heterocycle to a high level of detail Describes synthesis methods for 70 current drugs based on Piperidine scaffolds Gives drug designers all the key knowledge required to develop new drugs utilizing Piperidine Provides pharmacologists a solid overview of the chemical background of existing Piperidine-based drugs

This book focuses on the drug discovery and developmentapplications of transition metal catalyzed processes, which canefficiently create preclinical and clinical drug candidates as wellas marketed drugs. The authors pay particular attention tothe challenges of transitioning academically-developed reactionsinto scalable industrial processes. Additionally, the book lays thegroundwork for how continued development of transition metalcatalyzed processes can deliver new drug candidates. This workprovides a unique perspective on the applications of transitionmetal catalysis in drug discovery and development – it is aguide, a historical prospective, a practical compendium, and asource of future direction for the field.

Provides an introduction to the complex chemistry of heterocycles and an overview of the many and varied applications of this versatile class of compounds. The only book to examine the multidisciplinary applications of heterocycles, it features descriptions of the impact of heterocyclic compounds in living organisms: in the structure of DNA, enzymes and proteins, vitamins and antibodies and their role in plants and animals. The use of the compounds in the chemical industry is also covered. It is written in non-technical language by top researchers and includes problems at the end of each chapter.

Extensive experimentation and high failure rates are a well-recognised downside to the drug discovery process, with the resultant high levels of inefficiency and waste producing a negative environmental impact. Sustainable and Green Approaches in Medicinal Chemistry reveals how medicinal and green chemistry can work together to directly address this issue. After providing essential context to the growth of green chemistry in relation to drug discovery in Part 1, the book goes on to identify a broad range of practical methods and synthesis techniques in Part 2. Part 3 reveals how medicinal chemistry techniques can be used to improve efficiency, mitigate failure and increase the environmental benignity of the entire drug discovery process, whilst Parts 4 and 5 discuss natural products and microwave-induced chemistry. Finally, the role of computers in drug discovery is explored in Part 6. Identifies novel and cost effective green medicinal chemistry approaches for improved efficiency and sustainability Reflects on techniques for a broad range of compounds and materials Highlights sustainable and green chemistry pathways for molecular synthesis

Synthesis of Best-Seller Drugs

Scope of Selective Heterocycles from Organic and Pharmaceutical Perspective

Heterocyclic Chemistry in Drug Discovery

Indole Ring Synthesis

Synthetic Methods in Drug Discovery

Pyrazole-Based Drug Discovery

Applications of Heterocycles in the Design of Drugs and Agricultural Products, Volume 134 in the Advances in Heterocyclic Chemistry series represents the most definitive series in the field - one of great importance to organic chemists, polymer chemists, and many biological scientists. Chapters in this updated volume cover Hydroxy azoles as carboxylic acid bioisosteres, Cyclic sulfoxides and sulfones in drug design, Thiazoles and topological control in drug design, Applications of fused pyrrolidine [3.3.0] heterocycles in drug design, 1,4 Disubstituted and 1,4,5 trisubstituted-1,2,3-triazoles in drug discovery and development: from the flask to the clinic, and Conformationally restricted [3.2.2]- and [3.2.1]-3-azabicyclic diamines. Because biology and organic chemistry increasingly intersect, the associated nomenclature is being used more frequently in explanations. Written by established authorities in the field from around the world, this comprehensive review combines descriptive synthetic chemistry and mechanistic insight to yield an understanding of how chemistry drives the preparation and useful properties of heterocyclic compounds. Considered the definitive serial in the field of heterocyclic chemistry Serves as the go-to reference for organic chemists, polymer chemists and biological scientists Provides the latest, comprehensive reviews written by established authorities in the field Combines descriptive synthetic chemistry and mechanistic insight to enhance understanding of how chemistry drives the preparation and useful properties of heterocyclic compounds

Of the myriad of heterocycles known to man, the indole ring stands foremost for its remarkably versatile chemistry, its enormous range of biological activities, and its ubiquity in the terrestrial and marine environments. The indole ring continues to be discovered in natural products and to be employed in man-made pharmaceuticals and other materials. Given the enormous resurgence in indole ring synthesis over the past decade — highlighted by the power of transition metal catalysis — this authoritative guide addresses the need for a comprehensive presentation of the myriad of methods for constructing the indole ring, from the ancient to the modern, and from the obscure to the well-known. Following presentation of the classic indole ring syntheses and many newer methods, coverage continues with indole ring syntheses via pyrroles, indolines, oxindoles, isatins, radical and photochemical reactions, aryne cycloadditions. This extensive volume concludes with the modern transition metal–catalyzed indole ring syntheses that utilize copper, palladium, rhodium, gold, ruthenium, platinum, and other metals to fashion the indole ring Indole Ring Synthesis is

a comprehensive, authoritative and up-to-date guide to the synthesis of this important heterocycle for organic chemists, pharmaceutical researchers and those interested in the chemistry of natural products.
Metabolism, Pharmacokinetics and Toxicity of Functional Groups
Drug Synthesis
Advances in the Design and Synthesis of Antimicrobial Agents
An Introduction to Heterocyclic Chemistry, Biochemistry and Applications
Strategies, Methods, and the Role of Catalysis