Diversity Oriented Synthesis Basics And Applications In Organic Synthesis Drug Discovery And Chemical Biology

Has the concept of Diversity Oriented Synthesis remained unchanged over these two decades, or do we observe improvements or deviations from the original guidelines drawn by the pioneers? The aim of this Research Topic is to collect contributions on the state-of-the-art and progress of Diversity Oriented Synthesis, and to foresee its shape in the next decade.

Small Molecule Drug Discovery: Methods, Molecules and Applications presents the methods used to identify bioactive small molecules, synthetic strategies and techniques to produce novel chemical entities and small molecule libraries, chemoinformatics to characterize and enumerate chemical libraries, and screening methods, including biophysical techniques, virtual screening and phenotypic screening. The second part of the book gives an overview of privileged cyclic small molecules and major classes of natural product-derived small molecules, including carbohydrate-derived compounds, peptides and peptidomimetics, and alkaloid-inspired compounds. The last section comprises an exciting collection of selected case studies on drug discovery enabled by small molecules in the fields of cancer research, CNS diseases and infectious

diseases. The discovery of novel molecular entities capable of specific interactions represents a significant challenge in early drug discovery. Small molecules are low molecular weight organic compounds that include natural products and metabolites, as well as drugs and other xenobiotics. When the biological target is well defined and understood, the rational design of small molecule ligands is possible. Alternatively, small molecule libraries are being used for unbiased assays for complex diseases where a target is unknown or multiple factors contribute to a disease pathology. Outlines modern concepts and synthetic strategies underlying the building of small molecules and their chemical libraries useful for drug discovery Provides modern biophysical methods to screening small molecule libraries, including high-throughput screening, small molecule microarrays, phenotypic screening and chemical genetics Presents the most advanced chemoinformatics tools to characterize the structural features of small molecule libraries in terms of chemical diversity and complexity, also including the application of virtual screening approaches Gives an overview of structural features and classification of natural product-derived small molecules, including carbohydrate derivatives, peptides and peptidomimetics, and alkaloid-inspired small molecules

Recent Advances in Applications of Name Reactions in Multicomponent

Reactions is an ideal reference for researchers and postgraduate students studying organic chemistry, as well as synthetic organic chemists working on the development of novel methodologies for the synthesis of various heterocyclic systems, especially drug design and discovery, in both academia and industry. The book reviews recent applications of name reactions in multicomponents for the synthesis of heterocycles and examines recent advances in applications of significant name reactions, such as Ugi and Passirini, Click, Knoevenagel, Michael, Diels-Alder, Aldol, Mannich, Heck, Huisgen, and Suzuki in MCRs. These reactions can be used in the synthesis of a wide variety of novel heterocycles with different sizes and heteroatoms, as well as in the total synthesis of natural products in order to decrease the number of synthetic steps. Since chiral inductions are necessary for most of these sequential name reactions, their asymmetric catalyzed reactions are also described. Includes the synthesis of many heterocycles, which is ideal for synthetic organic chemists engaged in the synthesis of heterocyclic systems Covers the recent advances of asymmetric synthesis of a wide range of heterocycles in satisfactory enantioselectivities (ees) or distereoselectivities (des) Reviews the synthesis of a wide variety of interesting heterocycles by using a combination of different and versatile name reactions via MCRs

This book is for readers with some background in science, concerning the search for drugs, starting from molecular diversity in nature or molecular wilderness. Drug molecules may be used as such, or as starting points for improved drugs obtained from the interface of chemistry and biology. In some cases, the essential molecular features for drug properties from natural molecules may be identified and modified to more effective ones. In other cases, nature provides the targets, such as essential enzymes from infectious microorganisms, from which synthetic drugs can be designed. The mechanisms of action of drugs can be discerned by studying target–drug interactions. Nature may fight back, as in cases when microorganisms become resistant to drugs, but we can again use the chemistry–biology interface to obtain drugs which overcome the resistance. The battle goes on, hopefully with victory for both humans and balance of nature. This book differs from those available on the subject of natural products and drugs derived therefrom in that it looks at the broad picture on how materials and organisms from nature affect our health and how we have combined our knowledge in chemistry, biology, and biodiversity to promote our wellness from resources in the "molecular wilderness," with caveats on sustainable utilization of these resources. It is therefore suitable, not only for readers interested in science and medicine, but also for those with interest in policy issues concerning

sustainable development, environment, and issues concerning interaction of science and society in general.

This book on click reactions to focus on organic synthesis, this reference work describes the click concept and underlying mechanisms as well as the main applications in various fields. As such, the chapters cover green chemical synthesis, metal-free click reactions, synthesis of pharmaceuticals, peptides, carbohydrates, DNA, macrocycles, dendrimers, polymers, and supramolecular architectures. By filling a gap in the market, this is the ultimate reference for synthetic chemists in academia and industry aiming for a fast and simple design and synthesis of novel compounds with useful properties.

Thirty years after its publication, The Death and Life of Great American Cities was described by The New York Times as "perhaps the most influential single work in the history of town planning....[It] can also be seen in a much larger context. It is first of all a work of literature; the descriptions of street life as a kind of ballet and the bitingly satiric account of traditional planning theory can still be read for pleasure even by those who long ago absorbed and appropriated the book's arguments." Jane Jacobs, an editor and writer on architecture in New York City in the early sixties, argued that urban diversity and vitality were being destroyed by powerful architects and city planners. Rigorous, sane, and

delightfully epigrammatic, Jacobs's small masterpiece is a blueprint for the humanistic management of cities. It is sensible, knowledgeable, readable, indispensable. The author has written a new foreword for this Modern Library edition.

Discover an enhanced synthetic approach to developing andscreening chemical compound libraries Diversity-oriented synthesis is a new paradigm for developinglarge collections of structurally diverse small molecules as probesto investigate biological pathways. This book presents the mosteffective methods in diversity-oriented synthesis for creatingsmall molecule collections. It offers tested and proven strategiesfor developing diversity-oriented synthetic libraries and screeningmethods for identifying ligands. Lastly, it explores some promisingnew applications based on diversity-oriented synthesis that havethe potential to dramatically advance studies in drug discovery andchemical biology. Diversity-Oriented Synthesis begins with an introductorychapter that explores the basics, including a discussion of therelationship between diversity-oriented synthesis and classiccombinatorial chemistry. Divided into four parts, the book: Offers key chemical methods for the generation of smallmolecules using diversity-oriented principles, includingpeptidomimetics and macrocycles Expands on the concept of diversity-oriented synthesis bydescribing chemical libraries Provides modern

approaches to screening diversity-orientedsynthetic libraries, including high-throughput and high-contentscreening, small molecule microarrays, and smart screeningassays Presents the applications of diversity-oriented syntheticlibraries and small molecules in drug discovery and chemicalbiology, reporting the results of key studies and forecasting therole of diversity-oriented synthesis in future biomedicalresearch This book has been written and edited by leading internationalexperts in organic synthesis and its applications. Theircontributions are based on a thorough review of the currentliterature as well as their own firsthand experience developingsynthetic methods and applications. Clearly written and extensively referenced,Diversity-Oriented Synthesis introduces novices to thishighly promising field of research and serves as a springboard forexperts to advance their own research studies and develop newapplications. This book comprehensively describes the development and practice of DNA-encoded library synthesis technology. Together, the chapters detail an approach to drug discovery that offers an attractive addition to the portfolio of existing hit generation technologies such as high-throughput screening, structure-based drug discovery and fragment-based screening. The book: Provides a valuable guide for understanding and applying DNA-encoded combinatorial chemistry Helps chemists generate and screen novel chemical libraries of large size and quality

Bridges interdisciplinary areas of DNA-encoded combinatorial chemistry – synthetic and analytical chemistry, molecular biology, informatics, and biochemistry Shows medicinal and pharmaceutical chemists how to efficiently broaden available “chemical space” for drug discovery Provides expert and up-to-date summary of reported literature for DNA-encoded and DNA-directed chemistry technology and methods

Synthetic chemistry plays a central role in many areas of chemical biology; utilising recent case studies, the goal of Chemical and Biological Synthesis is to highlight the full impact that the preparation of novel reagents can have in chemical biology. Covering the synthetic approaches that can be applied across the whole field of chemical biology, this book provides synthetic chemists with the broader context to which their work contributes and the biological questions that can be addressed through it. An ideal guide for postgraduate students and researchers in synthetic organic chemistry and chemical biology, Chemical and Biological Synthesis introduces synthetic techniques and methods to those who wish to incorporate synthesis for the first time in their biology-focused research programmes.

This book provides techniques to tackle the design challenges raised by the increasing diversity and complexity of emerging, heterogeneous architectures for

embedded systems. It describes an approach based on techniques from software engineering called aspect-oriented programming, which allow designers to control today's sophisticated design tool chains, while maintaining a single application source code. Readers are introduced to the basic concepts of an aspect-oriented, domain specific language that enables control of a wide range of compilation and synthesis tools in the partitioning and mapping of an application to a heterogeneous (and possibly multi-core) target architecture. Several examples are presented that illustrate the benefits of the approach developed for applications from avionics and digital signal processing. Using the aspect-oriented programming techniques presented in this book, developers can reuse extensive sections of their designs, while preserving the original application source-code, thus promoting developer productivity as well as architecture and performance portability. Describes an aspect-oriented approach for the compilation and synthesis of applications targeting heterogeneous embedded computing architectures. Includes examples using an integrated tool chain for compilation and synthesis. Provides validation and evaluation for targeted reconfigurable heterogeneous architectures. Enables design portability, given changing target devices· Allows developers to maintain a single application source code when targeting multiple architectures.

Since the publication of the pioneering first edition of Chemical Genomics and Proteomics more than seven years ago, the area of chemical genomics has rapidly expanded and diversified to numerous novel methods and subdisciplines, such as chemical glycomics and lipidomics. This second edition has been updated to uniquely reflect this interdisciplina

Evidence-Based Validation of Herbal Medicines brings together current thinking and practice in the areas of characterization and validation of natural products. This book reviews all aspects of evaluation and development of medicines from plant sources, including their cultivation, collection, phytochemical and phyto-pharmacological evaluation, and therapeutic potential. Emphasis is placed on describing the full range of evidence-based analytical and bio-analytical techniques used to characterize natural products, including –omic technologies, phyto-chemical analysis, hyphenated techniques, and many more. Includes state-of-the-art methods for detecting, isolating, and performing structure elucidation by degradation and spectroscopic techniques Covers biosynthesis, synthesis, and biological activity related to natural products Consolidates information to save time and money in research Increases confidence levels in quality and validity of natural products

A new perspective on the design of molecular therapeutics is emerging. This new

strategy emphasizes the rational complementation of functionality along extended patches of a protein surface with the aim of inhibiting protein/protein interactions. The successful development of compounds able to inhibit these interactions offers a unique chance to selectively intervene in a large number of key cellular processes related to human disease. Protein Surface Recognition presents a detailed treatment of this strategy, with topics including: an extended survey of protein-protein interactions that are key players in human disease and biology and the potential for therapeutics derived from this new perspective the fundamental physical issues that surround protein-protein interactions that must be considered when designing ligands for protein surfaces examples of protein surface-small molecule interactions, including treatments of protein-natural product interactions, protein-interface peptides, and rational approaches to protein surface recognition from model to biological systems a survey of techniques that will be integral to the discovery of new small molecule protein surface binders, from high throughput synthesis and screening techniques to in silico and in vitro methods for the discovery of novel protein ligands. Protein Surface Recognition provides an intellectual “tool-kit” for investigators in medicinal and bioorganic chemistry looking to exploit this emerging paradigm in drug discovery.

Advances in chemistry, biology and genomics coupled with laboratory automation and computational technologies have led to the rapid emergence of the multidisciplinary field of chemical genomics. This edited text, with contributions from experts in the field, discusses the new techniques and applications that help further the study of chemical genomics. The beginning chapters provide an overview of the basic principles of chemical biology and chemical genomics. This is followed by a technical section that describes the sources of small-molecule chemicals; the basics of high-throughput screening technologies; and various bioassays for biochemical-, cellular- and organism-based screens. The final chapters connect the chemical genomics field with personalized medicine and the druggable genome for future discovery of new therapeutics. This book will be valuable to researchers, professionals and graduate students in many fields, including biology, biomedicine and chemistry.

Numerous genetic methods can be utilised to link a phenotype to a single molecular target but annotated small molecule chemical probes and even entire chemogenomic libraries are increasingly being used as a complementary approach. This book will comprehensively cover the state of the art in chemical probes and best practice for use in target discovery, illustrated throughout with examples. Ideal for students and established biochemists, the book will also

cover new technologies for probe discovery, new probe modalities, the new field of probes for RNA targets and the mature field of kinase chemical probes.

This book presents an introductory overview of Actinobacteria with three main divisions: taxonomic principles, bioprospecting, and agriculture and industrial utility, which covers isolation, cultivation methods, and identification of Actinobacteria and production and biotechnological potential of antibacterial compounds and enzymes from Actinobacteria. Moreover, this book also provides a comprehensive account on plant growth-promoting (PGP) and pollutant degrading ability of Actinobacteria and the exploitation of Actinobacteria as ecofriendly nanofactories for biosynthesis of nanoparticles, such as gold and silver. This book will be beneficial for the graduate students, teachers, researchers, biotechnologists, and other professionals, who are interested to fortify and expand their knowledge about Actinobacteria in the field of Microbiology, Biotechnology, Biomedical Science, Plant Science, Agriculture, Plant pathology, Environmental Science, etc.

The Practice of Medicinal Chemistry fills a gap in the list of available medicinal chemistry literature. It is a single-volume source on the practical aspects of medicinal chemistry. Considered ""the Bible"" by medicinal chemists, the book emphasizes the methods that chemists use to conduct their research and design new drug entities. It serves as a practical

handbook about the drug discovery process, from conception of the molecules to drug production. The first part of the book covers the background of the subject matter, which includes the definition and history of medicinal chemistry, the measurement of biological activities, and the main phases of drug activity. The second part of the book presents the road to discovering a new lead compound and creating a working hypothesis. The main parts of the book discuss the optimization of the lead compound in terms of potency, selectivity, and safety. The Practice of Medicinal Chemistry can be considered a ""first-read"" or ""bedside book"" for readers who are embarking on a career in medicinal chemistry. NEW TO THIS EDITION: * Focus on chemoinformatics and drug discovery * Enhanced pedagogical features * New chapters including: - Drug absorption and transport - Multi-target drugs * Updates on hot new areas: NEW! Drug discovery and the latest techniques NEW! How potential drugs can move through the drug discovery/ development phases more quickly NEW! Chemoinformatics 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

Linker design is an expanding field with an exciting future in state-of-the-art organic synthesis. Ever-increasing numbers of ambitious solution phase reactions are being adapted for solid-phase organic chemistry and to accommodate them, large numbers of sophisticated linker units have been developed and are now routinely employed in solid-phase synthesis. Linker Strategies in Solid-Phase Organic Synthesis guides the reader through the evolution of linker units from their genesis in solid-supported peptide chemistry to the cutting edge diversity linker units that are defining a new era of solid phase synthesis. Individual linker classes are covered in easy to follow chapters written by international experts in their respective fields and offer a comprehensive guide to linker technology whilst simultaneously serving as a handbook of synthetic transformations now possible on solid supports. Topics include: the principles of solid phase organic synthesis electrophile and nucleophile cleavable linker units cyclative cleavage as a solid phase strategy photocleavable linker units safety-catch linker units enzyme cleavable linker units T1 and T2 –versatile triazene linker groups hydrazone linker units benzotriazole linker units phosphorus linker units sulfur linker units selenium and tellurium linker units sulfur, oxygen and selenium linker units cleaved by radical processes silicon and germanium linker units boron and stannane linker units bismuth linker units transition metal carbonyl linker units linkers releasing olefins or cycloolefins by ring-closing metathesis fluorous linker units solid-phase radiochemistry The book concludes with extensive linker selection tables, cataloguing the linker units described in this book according to the substrate liberated

upon cleavage and conditions used to achieve such cleavage, enabling readers to choose the right linker unit for their synthesis. Linker Strategies in Solid-Phase Organic Synthesis is an essential guide to the diversity of linker units for organic chemists in academia and industry working in the broad areas of solid-phase organic synthesis and diversity oriented synthesis, medicinal chemists in the pharmaceutical industry who routinely employ solid-phase chemistry in the drug discovery business, and advanced undergraduates, postgraduates, and organic chemists with an interest in leading-edge developments in their field.

Methods in Enzymology series, highlights new advances in the field, with this new volume presenting interesting chapters. Each chapter is written by an international board of authors. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Methods of Enzymology series Updated release includes the latest information on the Synthetic and Enzymatic Modifications of the Peptide Backbone

This book highlights the new frontiers in chemical biology and describes their impact and future potential in drug discovery.

Retaining the proven didactic concept of the successful "Chemical Biology - Learning through Case Studies", this sequel features 27 new case studies, reflecting the rapid growth in this interdisciplinary topic over the past few years. Edited by two of the world's leading researchers in the field, this textbook introduces students and researchers to the modern approaches in chemical biology, as well as important results, and the techniques and methods applied. Each chapter presents a different biological problem taken from everyday lab work, elucidated by an international team of renowned scientists. With its broad coverage, this is a valuable source of

information for students, graduate students, and researchers working on the borderline between chemistry, biology, and biochemistry.

Addressing a dynamic aspect of organic chemistry, this book describes synthetic strategies and applications for multicomponent reactions – including key routes for synthesizing complex molecules. • Illustrates the crucial role and the important utility of multicomponent reactions (MCRs) to organic syntheses • Compiles novel and efficient synthetic multicomponent procedures to give readers a complete picture of this class of organic reactions • Helps readers to design efficient and practical transformations using multicomponent reaction strategies • Describes reaction background, applications to synthesize complex molecules and drugs, and reaction mechanisms

Combinatorial Chemistry encompasses both the design of compounds for specific pharmacological use and the screening of molecules in high throughput automated tests to find active agents with specific functions. *Analytical techniques *Direct sorting split and pool combinatorial synthesis *Linkers and their applications *Microwave assisted synthesis *Oligosaccharide chemistry *Peptide Synthesis and Screening *Polymer assisted approaches *Small molecule and heterocycle synthesis

Emerging as a discipline in the first half of the twentieth century, the information sciences study how people, groups, organizations, and governments create, share, disseminate, manage, search, access, evaluate, and protect information, as well as how different technologies and policies can facilitate and constrain these activities. Given the broad span of the information sciences, it is perhaps not surprising that there

is no consensus regarding its underlying theory—the purposes of it, the types of it, or how one goes about developing new theories to talk about new research questions. Diane H. Sonnenwald and the contributors to this volume seek to shed light on these issues by sharing reflections on the theory-development process. These reflections are not meant to revolve around data collection and analysis; rather, they focus on the struggles, challenges, successes, and excitement of developing theories. The particular theories that the contributors explore in their essays range widely, from theories of literacy and reading to theories of design and digital search. Several chapters engage with theories of the behavior of individuals and groups; some deal with processes of evaluation; others reflect on questions of design; and the rest treat cultural and scientific heritage. The ultimate goal, Sonnenwald writes in her introduction, is to "encourage, inspire, and assist individuals striving to develop and/or teach theory development."

In this much needed resource, Maryellen Weimer-one of the nation's most highly regarded authorities on effective college teaching-offers a comprehensive work on the topic of learner-centered teaching in the college and university classroom. As the author explains, learner-centered teaching focuses attention on what the student is learning, how the student is learning, the conditions under which the student is learning, whether the student is retaining and applying the learning, and how current learning positions the student for future learning. To help educators accomplish the goals of

learner-centered teaching, this important book presents the meaning, practice, and ramifications of the learner-centered approach, and how this approach transforms the college classroom environment. Learner-Centered Teaching shows how to tie teaching and curriculum to the process and objectives of learning rather than to the content delivery alone.

Traditionally, the search for new compounds from natural products has been a time- and resource-intensive process. The recent application of combinatorial methods and high-throughput synthesis has allowed scientists to generate a range of new molecular structures from natural products and observe how they interact with biological targets. Combinatorial Synthesis of Natural Product-Based Libraries summarizes the most important perspectives on the application of combinatorial chemistry and natural products to novel drug discovery. The book details the latest approaches for implementing combinatorial research and testing methodologies to the synthesis of natural product-based libraries. Interconnecting the important aspects of this emerging field through the work of several leading scientists, it covers the computational analysis of natural molecules and details strategies for designing compound libraries, using bioinformatics in particular. The authors describe numerous synthetic methods for producing natural products and their analogs, including engineered biosynthesis and polymer-supported reagents. They also discuss additional considerations for generating libraries, such as screening, scaffolding, and yield optimization. Other chapters

examine specific classes of libraries derived from natural products including carbohydrates, polyketides, peptides, alkaloids, terpenoids, steroids, flavonoids, and fungal compounds. Drawing attention to the interplay of drug discovery, natural products, and organic synthesis, Combinatorial Synthesis of Natural Product-Based Libraries contains the most recent and significant methods used to search and assess new compounds for their ability to mitigate biological processes that may lead to improved treatments for various diseases.

Diversity-Oriented SynthesisBasics and Applications in Organic Synthesis, Drug Discovery, and Chemical BiologyJohn Wiley & Sons

Stressing strategic and technological solutions to medicinal chemistry challenges, this book presents methods and practices for optimizing the chemical aspects of drug discovery. Chapters discuss benefits, challenges, case studies, and industry perspectives for improving drug discovery programs with respect to quality and costs. • Focuses on small molecules and their critical role in medicinal chemistry, reviewing chemical and economic advantages, challenges, and trends in the field from industry perspectives • Discusses novel approaches and key topics, like screening collection enhancement, risk sharing, HTS triage, new lead finding approaches, diversity-oriented synthesis, peptidomimetics, natural products, and high throughput medicinal chemistry approaches • Explains how to reduce design-make-test cycle times by integrating medicinal chemistry, physical chemistry, and ADME profiling techniques • Includes

descriptive case studies, examples, and applications to illustrate new technologies and provide step-by-step explanations to enable them in a laboratory setting
Focusing on biosynthesis, this book provides readers with approaches and methodologies for modern organic synthesis. By discussing major biosynthetic pathways and their chemical reactions, transformations, and natural products applications; it links biosynthetic mechanisms and more efficient total synthesis. • Describes four major biosynthetic pathways (acetate, mevalonate, shikimic acid, and mixed pathways and alkaloids) and their related mechanisms • Covers reactions, tactics, and strategies for chemical transformations, linking biosynthetic processes and total synthesis • Includes strategies for optimal synthetic plans and introduces a modern molecular approach to natural product synthesis and applications • Acts as a key reference for industry and academic readers looking to advance knowledge in classical total synthesis, organic synthesis, and future directions in the field
This volume gives an overview of state of the art technologies and future developments in the field of preclinical pharmaceutical research. A balanced mix of experts from academia and industry give insight in selected new developments in the drug discovery pathway. The topics cover the different parts of the drug discovery process, starting with new developments in the target identification and validation area. The lead generation part as a next step focuses on the requirements and technologies to identify new small molecules as lead compounds for further optimization; in a second section

the technologies to identify biologics as leads are addressed. The final part focuses on the pharmacological models and technologies to characterize new compounds and the impact of biomarkers to facilitate the transfer of drug candidates into the development phase.

An in-depth exploration of the applications of plant bioactive metabolites in drug research and development Highlighting the complexity and applications of plant bioactive metabolites in organic and medicinal chemistry, Plant Bioactives and Drug Discovery: Principles, Practice, and Perspectives provides an in-depth overview of the ways in which plants can inform drug research and development. An edited volume featuring multidisciplinary international contributions from acclaimed scientists researching bioactive natural products, the book provides an incisive overview of one of the most important topics in pharmaceutical studies today. With coverage of strategic methods of natural compound isolation, structural manipulation, natural products in clinical trials, quality control, and more, and featuring case studies on medicinal plants, the book serves as a definitive guide to the field of plant biodiversity as it relates to medicine. In addition, chapters on using natural products as drugs that target specific disease areas, including neurological disorders, inflammation, infectious diseases, and cancer, illustrate the myriad possibilities for therapeutic applications. Wide ranging and comprehensive, Plant Bioactives and Drug Discovery also includes important information on marketing, regulations, intellectual property rights, and academic-

industry collaboration as they relate to plant-based drug research, making it an essential resource for advanced students and academic and industry professionals working in biochemical, pharmaceutical, and related fields.

This text covers new techniques and applications in chemical genomics for researchers, professionals and graduates in biology, biomedicine and chemistry.

In the very first book on this hot topic, the expert editors andauthors present a comprehensive overview of these elegantreactions. From the contents: Organoboron compounds Free-radical mediated multicomponent coupling reactions Applications in drug discovery Metal catalyzed reactions Total synthesis of natural products Asymmetric isocyanide-based reactions The Biginelli reaction Asymmetric isocyanide-based reactions The Domino-Knoevenagel-Hetero-Diels-Alder Reaction and relatedtransformations Catalytic asymmetric reactions Algorithm based methods for discovering novel reactions Post-condensation modifications of the Passerini and Ugireactions An essential reference for organic and catalytic chemists, andthose working in organometallics both in academia and industry.

A peptidomimetic is a small protein-like chain designed to mimic a peptide with adjusted molecular properties such as enhanced stability or biological activity. It is a very powerful approach for the generation of small-molecule-based drugs as enzyme inhibitors or receptor ligands. Peptidomimetics in Organic and Medicinal Chemistry outlines the concepts and synthetic strategies underlying the building of bioactive compounds of a peptidomimetic nature. Topics covered include the chemistry of unnatural amino acids, peptide- and scaffold-based peptidomimetics, amino acid-side chain isosteres, backbone isosteres, dipeptide isosteres, beta-turn peptidomimetics, proline-mimetics as turn inducers, cyclic scaffolds, amino acid

surrogates, and scaffolds for combinatorial chemistry of peptidomimetics. Case studies in the hit-to-lead process, such as the development of integrin ligands and thrombin inhibitors, illustrate the successful application of peptidomimetics in drug discovery.

This three-volume set represents the first comprehensive coverage of the rapidly expanding field of Lewis base catalysis that has attracted enormous attention in recent years. Lewis base catalysis is a conceptually novel paradigm that encompasses an extremely wide variety of preparatively useful transformations and is particularly effective for enantioselectively constructing new stereogenic centers. As electron-pair donors, Lewis bases can influence the rate and stereochemical course of myriad synthetic organic reactions. The book presents the conceptual/mechanistic principles that underlie Lewis base catalysis, and then builds upon that foundation with a thorough presentation of many different reaction types. And last but not least, the editors, Prof. Edwin Vedejs and Prof. Scott E. Denmark, are without doubt the leaders in this emerging field and have compiled high quality contributions from an impressive collection of international experts.

Building on the success of the previous editions, the Textbook of Drug Design and Discovery, Fifth Edition, has been thoroughly revised and updated to provide a complete source of information on all facets of drug design and discovery for students of chemistry, pharmacy, pharmacology, biochemistry, and medicine. The information is presented in an up-to-date review form with an underlying and fundamental focus on the educational aspects. Beginning with an introduction to drug design and discovery, the first eight chapters cover molecular recognition, ligand-based drug design, and biostructure-based drug design. The authors also discuss drug-like properties and decision making in medicinal chemistry, chemical biology,

natural products in drug discovery, and in vivo imaging in drug discovery. The middle six chapters provide an overview of peptide and protein drug design, prodrugs in drug design and development, and enzyme inhibitors. The authors also go through receptors (structure, function, and pharmacology), ion channels (structure and function), and neurotransmitter transporters (structure, function, and drug binding). The following chapters address important neurotransmitter systems, GABA and glutamic acid receptors and transporter ligands, acetylcholine, histamine, dopamine and serotonin, and opioid and cannabinoid receptors. The book concludes with an examination of neglected diseases, anticancer agents, tyrosine kinase receptors, and antibiotics.

Presents both the fundamental concepts and the most recent applications in solid-phase organic synthesis With its emphasis on basic concepts, Solid-Phase Organic Synthesis guides readers through all the steps needed to design and perform successful solid-phase organic syntheses. The authors focus on the fundamentals of heterogeneous supports in the synthesis of organic molecules, explaining the use of a solid material to facilitate organic synthesis. This comprehensive text not only presents the fundamentals, but also reviews the most recent research findings and applications, offering readers everything needed to conduct their own state-of-the-art science experiments. Featuring chapters written by leading researchers in the field, Solid-Phase Organic Synthesis is divided into two parts: Part One, Concepts and Strategies, discusses the linker groups used to attach the synthesis substrate to the solid support, colorimetric tests to identify the presence of functional groups, combinatorial synthesis, and diversity-oriented synthesis. Readers will discover how solid-phase synthesis is currently used to facilitate the discovery of new molecular functionality. The final chapter

discusses how using a support can change or increase reaction selectivity. Part Two, Applications, presents examples of the solid-phase synthesis of various classes of organic molecules. Chapters explore general asymmetric synthesis on a support, strategies for heterocyclic synthesis, and synthesis of radioactive organic molecules, dyes, dendrimers, and oligosaccharides. Each chapter ends with a set of conclusions that underscore the key concepts and methods. References in each chapter enable readers to investigate any topic in greater depth. With its presentation of basic concepts as well as recent findings and applications, Solid-Phase Organic Synthesis is the ideal starting point for students and researchers in organic, medicinal, and combinatorial chemistry who want to take full advantage of current solid-phase synthesis techniques.