

Bioactive Compounds From Natural Sources Second Edition Natural Products As Lead Compounds In Drug Discovery

This book covers the recent innovations relating to various bioactive natural products (such as alkaloids, glycosides, flavonoids, anthraquinones, steroids, polysaccharides, tannins and polyphenolic compounds, volatile oils, fixed oils, fats and waxes, proteins and peptides, vitamins, marine products, camptothecin, piperines, carvacrol, gedunin, GABA, ginsenosides) and their applications in the pharmaceutical fields related to academic, research and industry.

Discovery and Development of Therapeutics from Natural Products against Neglected Tropical Diseases draws together research on medicinal agents from natural sources as starting points for the design of drugs against Neglected Tropical Diseases (NTDs). From the prediction of promising leads and identification of active agents, to the extraction of complex molecules, the book explores novel, economical and efficacious therapeutics for these diseases. It describes current research and the role of natural products, antimalarial compounds from marine natural products and sesquiterpene lactones, natural antileprotic agents, natural products with potential against Leishmaniasis, Trypanosomiasis and Dengue, and more. In addition, Quinoline and Isoquinoline alkaloids for developing new antiprotozoal agents are discussed, alongside anti-trypanosomatid heterocyclic compounds as structures for development.

Combining the expertise of specialists from around the world, this volume aims to support and encourage researchers in the investigation of natural sources as starting points for the development of novel, safe and effective agents for use against neglected tropical diseases. Includes chapters written by active researchers and leading global experts deeply engaged in the research field of natural product chemistry for drug discovery Draws together cutting-edge research advances in natural product chemistry that are targeted at neglected tropical diseases Highlights the future potential of natural products as sources of novel medicinal compounds against neglected tropical diseases

Total Synthesis of Bioactive Natural Products provides step-by-step guidelines for effectively synthesizing the most promising bioactive agents from a broad range of natural products. Beginning with a concise background that outlines the benefits and challenges faced in effective synthesis, the book goes on to provide individual outlines for approximately 100 of the most promising bioactive agents. Taking a logical, user-friendly approach, the systematic name, compound class, structure, natural source, pharmaceutical potential and synthetic routes for each structure are detailed, with clear illustrations throughout, making this book an essential and practical guide for anyone working with both synthesis and natural products. Provides individual outlines for the total synthesis of approximately 100 bioactive natural molecules Outlines each step of the process in detail, with full

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experimental information supported by extensive schemes Includes retrosynthetic analyses, reaction sequences and stereochemically crucial steps for each molecule

Natural products continue to serve as sources for the development of new medicines. There is currently a revival of interest in the discovery of bioactive compounds with new chemical structures from natural sources, largely due to the fact that synthetic libraries have not yielded the expected number of developmental candidates in the pharmaceutical industry during the last decade. In addition, the emergence of clinically relevant pathogens that are becoming increasingly resistant to currently used medicines strengthens the notion that natural product research is urgently required. Considering the fact that almost 10% of bioactive compounds are of microbial origin, and that marine microorganisms are relatively poorly studied compared to their terrestrial relatives, marine microorganisms are regarded as the most potential-laden resource for drug discovery.

Natural products hold a prominent position in the current discovery and development of drugs and have diverse indications for both human and animal health. Plants, in particular, play a leading role as a source of specialized metabolites with medical effects. Other organisms, such as marine and terrestrial animals and microorganisms, produce very important drug candidate molecules. Specialized metabolites from these varied natural sources can be used directly as bioactive compounds or drug precursors. In addition, due to their broad chemical diversity, they can act as drug prototypes and/or be used as pharmacological tools for different targets. Some examples of natural metabolites that have been developed into useful medical drug are cardiotonic digoxin from *Digitalis* sp., antimalarial artemisinin from *Artemisia annua*, anti-cancer taxol from *Taxus* sp., or podophyllotoxin from *Podophyllum peltatum*, which served as a synthetic model for the anti-cancer etoposide. The study of natural products is still attracting great scientific attention and their current importance, as a valuable lead for drug discovery, is undebatable. I cordially invite authors to contribute original articles, as well as survey articles, that give the readers of *Molecules* ****MOLECULES NEEDS TO BE ITALICIZED**** updated and new perspectives on natural products in drug discovery, including but not limited to natural sources, identification and separation of bioactive phytochemicals, standardization, new biological targets, pre-clinical and clinical trials, pharmacological effects/side effects, and bioassays.

Bioactive Marine Natural Products is the first book available that covers all aspects of bioactive marine natural products. It fills the void in the literature for bioactive marine natural products. The book covers various aspects of marine natural products and it is hoped that all the major classes of bioactive compounds are included. Different classes of marine organisms and the separation and isolation techniques are discussed. The chemistry and biology of marine toxins, peptides, alkaloids, nucleosides and prostanoids are discussed in detail.

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Biological, toxicological and clinical evaluations are also dealt with to ensure that the book may be adopted at any stage by any practicing organic chemist or biologist, working in academia or in R and D divisions of pharmaceutical companies. Each chapter in the book includes an abstract to highlight the major points discussed in the text and concluding remarks are given. References to books, monographs, review articles and original papers are provided at the end of each chapter.

This new volume explores the importance of phytochemicals from plants in therapeutics, focusing on the extraction of bioactive compounds and their applications in human health. Natural products and their bioactive compounds are increasingly utilized in preventive and therapeutic medication as well as for the production of pharmaceutical supplements and, more recently, as food additives to increase the functionality of foods. The first section of the volume describes recent advances in the extraction of bioactive compounds from various sources. It looks at advanced extraction techniques such as enzyme-assisted, microwave-assisted, ultrasound-assisted, pressurized liquid extraction, and supercritical extraction techniques. Part 2, on bioactive compounds and health claims, covers the roles of different bioactive compounds and their health-promoting potential for lifestyle diseases. This section explains the botany, physical characteristics, uniqueness, uses, distribution, importance, phytochemistry, bioactivities, and future trends of different functional foods. This timely book provides an overview of natural products/botanicals used for the management of insect-pest and diseases. It will help readers to update and widen their knowledge about natural products and their bio-activities against plant pathogens. The volume explores activity, chemistry, toxicity and geographic distribution of plants. Discussions concerning the methodology used for the detection of active principles, their mode of action and commercial prospects are of utmost importance and worthy of note. Focuses on recent achievements in natural bio-actives Global coverage of natural products / plants Targets the most important issues of natural botanicals/ biocides Includes innovative ideas with lucid explanations Contains specialized chapters, such as, natural control of multi-drug resistant organisms, anti-salmonella agents, natural house-dust-mite control agents, and naturally occurring anti-insect proteins, etc. Covers research on bioactives: From Lab to Field and Field to Market Includes eco-friendly and economically viable herbal technology

Bioactive natural products are proving to be a rich source of novel therapeutics to both protect against and combat diseases, as well as serve as lead compounds in crop protection. Following the successful format of the first edition, this volume brings together collective research from many new contributors and emphasizes the rationale behind the

Bioactive compounds produced by natural sources, such as plants, microbes, endophytic fungi, etc., can potentially be applied in various fields, including agriculture, biotechnology and biomedicine. Several bioactive compounds have

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proved to be invaluable in mediating plant-microbe interactions, and promoting plant growth and development. Due to their numerous health-promoting properties, these compounds have been widely used as a source of medication since ancient times. However, there is an unprecedented need to meet the growing demand for natural bioactive compounds in the flavor and fragrance, food, and pharmaceutical industries. Moreover, discovering new lead molecules from natural sources is essential to overcoming the rising number of new diseases. In this regard, natural bioactive compounds hold tremendous potential for new drug discovery. Therefore, this field of research has become a vital area for researchers interested in understanding the chemistry, biosynthetic mechanisms, and pharmacological activities of these bioactive metabolites. This book describes the basics of bioactive plant compounds, their chemical properties, and their pharmacological biotechnological properties with regard to various human diseases and applications in the drug, cosmetics and herbal industries. It offers a valuable asset for all students, educators, researchers, and healthcare experts involved in agronomy, ecology, crop science, molecular biology, stress physiology, and natural products.

Plants have been widely used to treat diseases, owing to the presence of bioactive compounds (phytochemicals) which play important roles in health promotion and disease prevention. In recent years, advances in chemical extraction techniques, lifestyle and dietary choices for human health have increased the interest in the consumption and study of fruits, vegetables, and foods enriched with bioactive compounds and nutraceuticals. Thousands of dietary phytochemicals, such as flavonoids, phenolic acids, glucosinolates, terpenes and alkaloids, have been identified and categorized further according to a diverse array of biochemical properties. Many of these phytochemicals have been hypothesized to reduce the risk of several pathological conditions which include life threatening diseases such as heart disease and cancer, to name a few. *Natural Bioactive Compounds from Fruits and Vegetables as Health Promoters* is a 2 book set which presents a summary of different classes of phytochemicals commonly found in common edible food sources. Each chapter details the general chemical structures of compounds, naturally present in specific fruits, vegetables and grains, their biological importance and mechanisms of action. The book set is an essential handbook for anyone interested in the natural product chemistry of these common crops. Part 1 of this set covers details about different fruits (banana, citrus fruits, pears, etc.). Part 2 covers legumes, nuts, seeds and cereals.

Natural products in the plant and animal kingdom offer a huge diversity of chemical structures that are the result of biosynthetic processes that have been modulated over the millennia through genetic effects. With the rapid developments in spectroscopic techniques and accompanying advances in high-throughput screening techniques, it has become possible to isolate and then determine the structures and biological activity of natural products rapidly, thus

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opening up exciting opportunities in the field of new drug development to the pharmaceutical industry. *Studies in Natural Products Chemistry* covers the synthesis or testing and recording of the medicinal properties of natural products, providing cutting edge accounts of the fascinating developments in the isolation, structure elucidation, synthesis, biosynthesis and pharmacology of a diverse array of bioactive natural products. Focuses on the chemistry of bioactive natural products Contains contributions by leading authorities in the field Presents sources of new pharmacophores

What can sharks teach us about our immune system? What can horseshoe crabs show us about eyesight? The more we learn about the ocean, the more we realize how critical these vast bodies of water are to our health and well-being. Sometimes the ocean helps us, as when a marine organism yields a new medical treatment. At other times, the ocean poses the threat of coastal storm surges or toxic algal blooms. *From Monsoons to Microbes* offers a deeper look into the oceans that surround us, often nurturing yet sometimes harming humankind. This book explores the links among physical oceanography, public health, epidemiology, marine biology, and medicine in understanding what the ocean has to offer. It will help readers grasp such important points as: How the ocean's sweeping physical processes create long-term phenomena such as El Nino and short-term disastrous events such as tsunamis--including what communities can do to prepare. What medicines and nutritional products have come from the ocean and what the prospects are for more such discoveries. How estuaries work--where salt and fresh water meet--and what can go wrong, as in the 7,000 square mile "dead zone" at the out-flow of the Mississippi River. How the growing demand for seafood and the expansion of ocean-going transport has increased our exposure to infectious agents--and how these agents can be tracked down and fought. Why "red tides" of toxic algae suddenly appear in previously unaffected coastal areas, and what happens when algal toxins find their way into our food supply or the air we breathe. The book recommends ways we can implement exciting new technologies to monitor the physics, chemistry, and biology of the ocean to recognize change as it happens. From the impact of worldwide atmospheric warming to the significance of exotic bacteria from submarine hydrothermal vents, the ocean has many depths left to explore. This book focuses on the modern approach to the isolation of biologically active natural products and provides numerous examples of the isolation and characterization of secondary metabolites. It emphasizes the synthetic or semi-synthetic analogues of natural products, relevant to those working on biomedical applications of natural products. It

Bioactive compounds play a central role in high-value product development in the chemical industry. Bioactive compounds have been identified from diverse sources and their therapeutic benefits, nutritional value and protective effects in human and animal healthcare have underpinned their application as pharmaceuticals and functional food ingredients. The orderly study of biologically

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active products and the exploration of potential biological activities of these secondary metabolites, including their clinical applications, standardization, quality control, mode of action and potential biomolecular interactions, has emerged as one of the most exciting developments in modern natural medicine. *Biotechnology of Bioactive Compounds* describes the current stage of knowledge on the production of bioactive compounds from microbial, algal and vegetable sources. In addition, the molecular approach for screening bioactive compounds is also discussed, as well as examples of applications of these compounds on human health. The first half of the book comprises information on diverse sources of bioactive compounds, ranging from microorganisms and algae to plants and dietary foods. The second half of the book reviews synthetic approaches, as well as selected bioactivities and biotechnological and biomedical potential. The bioactive compounds profiled include compounds such as C-phycocyanins, glycosides, phytosterols and natural steroids. An overview of the usage of bioactive compounds as antioxidants and anti-inflammatory agents, anti-allergic compounds and in stem cell research is also presented, along with an overview of the medicinal applications of plant-derived compounds. *Biotechnology of Bioactive Compounds* will be an informative text for undergraduate and graduate students of bio-medicinal chemistry who are keen to explore the potential of bioactive natural products. It also provides useful information for scientists working in various research fields where natural products have a primary role.

Recent Advances in Natural Products Analysis is a thorough guide to the latest analytical methods used for identifying and studying bioactive phytochemicals and other natural products. Chemical compounds, such as flavonoids, alkaloids, carotenoids and saponins are examined, highlighting the many techniques for studying their properties. Each chapter is devoted to a compound category, beginning with the underlying chemical properties of the main components followed by techniques of extraction, purification and fractionation, and then techniques of identification and quantification. Biological activities, possible interactions, levels found in plants, the effects of processing, and current and potential industrial applications are also included. Focuses on the latest analytical techniques used for studying phytochemical and other biological compounds. Authored and edited by the top worldwide experts in their field. Discusses the current and potential applications and predicts future trends of each compound group.

Phenolic compounds as a large class of metabolites found in plants have attracted attention since long time ago due to their properties and the hope that they will show beneficial health effects when taken as dietary supplements. This book presents the state of the art of some of the natural sources of phenolic compounds, for example, medicinal plants, grapes or blue maize, as well as the modern methods of extraction, quantification, and identification, and there is a special section discussing the treatment, removal, and degradation of phenols,

an important issue in those phenols derived from the pharmaceutical or petrochemical industries.

Evolutionary Diversity as a Source for Anticancer Molecules discusses evolutionary diversity as source for anticancer agents derived from bacteria, algae, bryophytes, pteridophytes, and gymnosperms. The book goes over the isolation of anticancer agents and the technology-enabled screening process used to develop anticancer drugs. The book also includes discussion of the nutraceuticals and natural products derived from invertebrates that can be used as part of cancer treatment. Evolutionary Diversity as a Source for Anticancer Molecules also deals with some of the current challenges in the prevention of cancer as well as the side effects of conventional drugs used for cancer patients. This book is a valuable resource for cancer researchers, oncologists, biotechnologists, pharmacologists, and any member of the biomedical field interested in understanding more about natural products with anticancer potential. Discusses the application of natural products in place of conventional drugs to minimize the side effects in cancer treatment Explains the relation between evolutionary mechanisms and climate change for production of secondary metabolites

Natural products have played an important role throughout the world in treating and preventing human diseases. Natural product medicines have come from various materials including terrestrial plants, terrestrial microorganisms, organisms etc. Historical experiences with plants as therapeutic tools have helped to introduce single chemical entries in modern medicine. About 40% of the drugs used are derived from natural sources. Most are pure substances which are isolated from various organisms & used directly or after chemical modification. Natural products will continue to be important in three areas of drug discovery: as targets for production by biotechnology as a source of new lead compounds of novel chemical structure and as the active ingredients of useful treatments derived from traditional systems. Biotechnology will contribute more new natural products for medicinal use. Plants provide a fertile source of natural products many of which are clinically important medicinal agents. Natural products have traditionally provided most of the drugs in use. Despite the achievements of synthetic chemistry and the advances towards rational drug design, natural products continue to be essential in providing medicinal compounds and as starting points for the development of synthetic analogues. With the increasing power of screening programs and the increasing interest in the reservoir of untested natural products, many future drug developments will be based, at least in part, on natural products. The major contents of the book are plant products produced in cell culture , application of genetic engineering to the production of pharmaceuticals , anti transpirants and plant growth regulators based , the potential and the problems of marine natural products, marine sterols, plants as a source of anti-inflammatory substances, anti hepatotoxic principles in oriental medicinal plants, immune stimulants of fungi and higher plants, amanita

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muscaria in medicinal chemistry, ergot alkaloids and their derivatives in medicinal chemistry and therapy, development of drugs from cannabinoids, etc. This book contains development of new drugs from plants, work on some Thai medicinal plants, plant growth based on Jasmonates, marine sterols, bleomycin and its derivatives, drugs from cannabinoids, bioactive compounds from nature, fungi and higher plants, biological active compounds from British Marine, microbial phytotoxins as herbicides and many more. This book will be very helpful to its readers, upcoming entrepreneurs, scientists, existing industries, technical institutions, druggist etc.

Inflammation and Natural Products brings together research in the area of the natural products and their anti-inflammatory action in medical, nutraceutical and food products, addressing specific chronic inflammatory diseases like cancer and the mechanistic aspects of the mode of action of some key natural products. Inflammation is a complicated process, driven by infection or injury or genetic changes, which results in triggering signalling cascades, activation of transcription factors, gene expression, increased levels of inflammatory enzymes, and release of various oxidants and pro-inflammatory molecules in inflammatory cells. Excessive oxidants and inflammatory mediators have a harmful effect on normal tissue, including toxicity, loss of barrier function, abnormal cell proliferation, inhibiting normal function of tissues and organs and finally leading to systemic disorders. The emerging development of natural product formulations utilizing the unique anti-inflammatory compounds such as polyphenols, polysaccharides, terpenes, fatty acids, proteins and several other bioactive components has shown notable successes. Inflammation and Natural Products: Recent Development and Current Status provides a comprehensive resource, ranging from detailed explanation on inflammation to molecular docking strategies for naturally occurring compounds with anti-inflammatory activity. It is useful for graduate students, academic and professionals in the fields of pharmaceutical and medical sciences and specialists from natural product-related industries. Increases the knowledge of anti-inflammatory activities of natural products and their mechanism of action Provides a new perspective and forward-thinking ideas to researchers, the scientific community and industry Intensifies the understanding of synergistic action of biologically active naturally occurring molecules and their biological activities against inflammation This book highlights different natural products that are derived from the plants and microbes that have shown potential as the lead compounds against infectious diseases and cancer. Natural products represent an untapped source of strikingly diverse chemotypes with novel mechanisms of action and the potential to serve as anticancer and anti-infective agents. The book discusses a range of biotechnologically valuable bioactive compounds and secondary metabolites that have been derived from plant and microorganisms from various ecological niches. It also reviews the latest developments in the field of genomics, bioinformatics and industrial fermentation for harnessing the microbial

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products for commercial applications. In turn, the book's closing section reviews important biotechnological applications of various natural products. Combining the expertise of specialists in this field, the book's goal is to promote the further investigation of natural sources for the development of standardized, safe and effective therapies.

Phytochemicals as Lead Compounds for New Drug Discovery presents complete coverage of the recent advances in the discovery of phytochemicals from medicinal plants as models to the development of new drugs and chemical entities. Functional bioactive compounds of plant origin have been an invaluable source for many human therapeutic drugs and have played a major role in the treatment of diseases around the world. These compounds possess enormous structural and chemical diversity and have led to many important discoveries. This book presents fundamental concepts and factors affecting the choice for plant-based products, as well as recent advances in computer-aided drug discovery and FDA drug candidacy acceptance criteria. It also details the various bioactive lead compounds and molecular targets for a range of life-threatening diseases including cancer, diabetes, and neurodegenerative diseases. Written by a global team of experts, *Phytochemicals as Lead Compounds for New Drug Discovery* is an ideal resource for drug developers, phytochemists, plant biochemists, food and medicinal chemists, nutritionists and toxicologists, chemical ecologists, taxonomists, analytical chemists, and other researchers in those fields. It will also be very valuable to professors, students, and researchers in this domain.

Presents fundamental concepts and factors affecting choice for plant-based products
Details the FDA drug candidacy acceptance criteria, including bottlenecks and way forward
Highlights recent advances in computational-based drug discovery
Focuses on the discovery of new drugs and potential druggable targets for the treatment of chronic diseases of world importance

Bioactive Compounds: Health Benefits and Potential Applications provides information about different bioactive compounds including their sources, biological effects, health benefits and, potential applications which could contribute as alternatives in the prevention or treatment of multifactorial diseases for vulnerable population groups. Going beyond the basics to include discussion of bioaccessibility and the legislative aspects of marketing of bioactive compounds as nutraceuticals or food supplements, this book presents insights from a global perspective. Written for researchers, professors and graduate students, this book is sure to be a welcomed reference for all who work in food chemistry, new product development and nutritional science. Highlights potential contributions of bioactive compounds as alternatives in the prevention or treatment of disease
Investigates the world of bioactive compounds and the many activities associated with them
Contains information relevant to food chemistry, new product development and nutritional science

This volume presents different aspects related to bioactive compounds, starting with their natural state in raw sources, physicochemical characterization and

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employment in pharmacy and medicine. The volume is divided into three parts. The first part describes the chemical structure of bioactive compounds from different natural sources such as olive oils, wines, and medicinal plants. Special attention has been given to identifying the bioactive composition within variations of these natural sources (for example, extra virgin, ordinary or lampante olive oils). The second part of the volume presents the principal methods used for detecting, identifying and quantifying bioactive compounds. Emphasis is given to the use of different types of sensors or biosensors, and multisensor systems in combination with analytical techniques. The final part explains the principal methods for protection of bioactive compounds and the implication of bioactive compounds in pharmacy. This volume is a useful guide for novice researchers interested in learning research methods to study bioactive compounds. *Frontiers in Bioactive Compounds* brings edited reviews on the analysis and characterization of natural compounds of medicinal interest. Each volume covers useful information on a variety of natural sources as well as analytical techniques. This series is essential reading for analytical and medicinal chemists as well as professionals involved in natural and pharmaceutical product research and development.

When introduced to the human body, bioactive metabolites produced by plants for self defense bind to particular biochemical targets, most notably to proteins involved in signaling by hormones and neurotransmitters. This, essentially, is the basis for the effects of herbal medicine. While herbal medicine preparations may act by complex synergistic interactions. Pharmacognosy is a term derived from the Greek words for drug (*pharmakon*) and knowledge (*gnosis*). It is a field of study within Chemistry focused on natural products isolated from different sources and their biological activities. Research on natural products began more than a hundred years ago and has continued up to now with a plethora of research groups discovering new ideas and novel active constituents. This book compiles the latest research in the field and will be of interest to scientists, researchers, and students.

Focusing on the importance of functional foods and their secondary metabolites for human health, this volume presents new insights with scientific evidence on the use of functional foods in the treatment of certain diseases. The plants covered and their bioactive compounds are easily accessible and are believed to be effective with fewer side effects in comparison with modern drugs in the treatment of different diseases. The plants contain chemical compounds that can modify and modulate biological systems, eliciting therapeutic effects. Some plants and derived products mentioned include black carrot, olive oil, citrus peel, grapes, candy leaf, cereals and grains, and green and black tea. The volume is divided into four sections that cover these topics: Functional foods for human health: the available sources, biochemistry, structural composition, and different biological activities, especially antioxidant activity. Pharmacological aspects of fruits and vegetables: the extraction of bioactive molecules, phytochemistry, and biological activities of a selection of plants. Pharmacological aspects of natural products: bioactive compounds, structural attributes, bioactivity of anthocyanin, piceatannol, and a review of the ethnobotany and medicinal properties of green and black tea. Pharmacological aspects of cereals and grains: the health benefits of flaxseed, wheatgrass juice, and use and therapeutic potential as supplements for disease management. *Water Extraction of Bioactive Compounds: From Plants to Drug Development* draws together the expert knowledge of researchers from around the world to outline the essential knowledge and techniques required to successfully extract bioactive compounds for further study. The

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book is a practical tool for medicinal chemists, biochemists, pharmaceutical scientists and academics working in the discovery and development of drugs from natural sources. The discovery and extraction of bioactive plant compounds from natural sources is of growing interest to drug developers, adding greater fuel to a simultaneous search for efficient, green technologies to support this. Particularly promising are aqueous based methods, as water is a cheap, safe and abundant solvent. The book is a detailed guide to the fundamental concepts and necessary equipment needed to successfully undertake such processes, supported by application examples and highlighting the most influential variables. Part 1 begins with a thorough introduction to plants as sources of drugs, highlighting strategies for the discovery of novel bioactive constituents of botanicals, the need for standardization and a move toward more rational and greener techniques in the field, the development of plant-based extraction processes and pretreatments for the efficient extraction. Part 2 then reviews a broad range of available techniques, including sections on conventional hot water extraction and pressurized hot water extraction in a range of settings. Intensified processes are then discussed in detail, including sections on microwave-assisted processes, ultrasound-assisted processes and enzyme assisted extraction. Covers the theoretical background and range of techniques available to researchers, helping them to select the most appropriate extraction method for their needs Presents up-to-date and cutting edge applications by international experts Highlights current use and future potential for industrial scale applications Offers a thorough introduction to plants as sources of drugs, highlighting strategies for the discovery of novel bioactive constituents of botanicals

Biotechnological Production of Bioactive Compounds provides insights on the most recent innovations, trends, concerns, solutions and practical challenges encountered in the fields of enzyme technology and nanobiotechnology for the production of bioactive materials with extra health benefits. As nanobiotechnology has improved the bioactive extraction process significantly, many bioactives, including bioflavonoids, omega-3 fatty acids, biopigments and low calorie sugar substitutes are a pivotal part of the food industry. The book highlights the production of extra health benefits "bioactives" from plants and microbes and explains how the extraction efficiency of bioactives molecules improves significantly with the recent advances in nanobiotechnology. Researchers in the fields of biochemical engineering, biotechnology, bioremediation, environmental sustainability and those in pharma industries will find the information in this book very helpful and illuminating. Outlines technological advances in bioactives extraction Covers bioflavonoids, biopigments, omega-3-fatty acids and low sugar substitutes Explains the mechanisms of Green cargo (biogenic nanoparticles) for the delivery of bioactive molecules

Interest in obtaining biologically active compounds from natural sources has recently spiked due to their low toxicity, complete biodegradability, availability from renewable sources, and in most cases, low cost. Taking an interdisciplinary approach, *Bioactive Compounds from Natural Sources: Isolation, Characterization, and Biological Properties* covers general methods and main topics in the research field of bioactive natural products. The book describes general screening methods, modern HPLC hyphenated techniques, and NMR methods in the structural elucidation of compounds and devotes individual chapters to specific topics of research. Surveys on compounds displaying important pharmacological activities are presented in chapters devoted to Mexican medicinal plants, anti-tumor drugs of natural origin, cancer chemopreventive flavonoids, and metabolites displaying anti-HIV, antioxidative, antimalarial, and anti-inflammatory activity. The final chapters are devoted to representative examples of research into marine metabolites: immunomodulating marine glycolipids and surveys of bioactive compounds from marine opisthobranchs and Japanese soft corals. With its focus on modern approaches to the isolation of biologically active natural products, this book encourages interdisciplinary work among chemists, pharmacologists, biologists, botanists, and

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agronomists with an interest in bioactive natural products.

Natural bioactive compounds have become an integral part of plant-microbe interactions geared toward adaptation to environmental changes. They regulate symbiosis, induce seed germination, and manifest allelopathic effects, i.e., they inhibit the growth of competing plant species in their vicinity. In addition, the use of natural bioactive compounds and their products is considered to be suitable and safe in e.g. alternative medicine. Thus, there is an unprecedented need to meet the increasing demand for plant secondary metabolites in the flavor and fragrance, food, and pharmaceutical industries. However, it is difficult to obtain a constant quantity of compounds from the cultivated plants, as their yield fluctuates due to several factors including genotypic variations, the geography, edaphic conditions, harvesting and processing methods. Yet familiarity with these substances and the exploration of various approaches could open new avenues in their production. This book describes the basis of bioactive plant compounds, their mechanisms and molecular actions with regard to various human diseases, and their applications in the drug, cosmetic and herbal industries. Accordingly, it offers a valuable resource for students, educators, researchers, and healthcare experts involved in agronomy, ecology, crop science, molecular biology, stress physiology, and natural products.

Bioactive natural products are a rich source of novel therapeutics. Thus, the search for bioactive molecules from nature continues to play an important role in fashioning new medicinal agents. This volume, which comprises sixteen chapters written by active researchers and leading experts in natural products chemistry, brings together an overview of current discoveries in this remarkable field. It also provides information on the industrial application of natural products for medicinal purposes. This book will serve as a valuable resource for researchers to predict promising leads for developing pharmaceuticals to treat various ailments and disease manifestations.

Food Safety and Preservation: Modern Biological Approaches to Improving Consumer Health explores the most recent and investigated hot topics in food safety, microbial contamination, food-borne diseases and advanced preservation methods. It brings together the significant, evidence-based scientific progress of various approaches to improve the safety and quality of foods, also offering solutions to help address food industry challenges. Recent studies and technological advancements in biological control are presented to control foodborne pathogens. In addition, analytical methods for reducing potential biological hazards make this book essential to researchers, scientists, technologists and grad students. Covers all aspects of food contamination, from food degradation, to food-borne diseases Examines validated, biological control approaches to reduce microbial and chemical contamination Includes detailed discussions of risk and safety assessments in food preservation

Natural Bioactive Compounds: Technological Advancements deals with the latest breakthroughs in the field of screening, characterization and novel applications of natural bioactive compounds from diverse group of organisms ranging from bacteria, viruses, cyanobacteria, algae, fungi, bryophytes, higher plants, sponges, corals and fishes. Written by some of the most reputed scientists in the field, this book introduces the reader to strategies and methods in the search for bioactive natural products. It is an essential read for researchers and students interested in bioactive natural products, their biological and pharmacological

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properties, their possible use as chemopreventive or chemotherapeutic agents, and other future potential applications. Explores natural sources of bioactive compounds, including cyanobacteria, bacteria, viruses, fungi and higher plants Discusses the potential applications of biological products, such as their use in medicine (antibiotics, cancer research, immunology), as food additives, supplements and technological substances Analyzes the contributions of emerging or developing technologies for the study of bioactive natural compounds (characterization and purification)

There is continuing interest in natural products as sources of potentially new and exciting chemical compounds. This book brings together the knowledge, perspectives and research findings of a varied group of scientists on a wide range of topics, from microarrays, genetics and bioinformatics to yeast-based technologies and enzyme studies.

This textbook describes the types of natural products, the biosynthetic pathways that enable the production of these molecules, and an update on the discovery of novel products in the post-genomic era.

The first edition of *Bioactive Compounds from Natural Sources* was published in a period of renewed attention to biologically active compounds of natural origin. This trend has continued and intensified—natural products are again under the spotlight, in particular for their possible pharmacological applications. Largely focusing on natural products as lead compounds in drug discovery, *Bioactive Compounds from Natural Sources, Second Edition: Natural Products as Lead Compounds in Drug Discovery* is actually a completely new volume containing surveys of selected recent advances in an interdisciplinary area covering chemistry of natural products, medicinal chemistry, biochemistry, and other related topics. Written by some of the most reputed scientists in the field, this second edition includes new chapters from authors who contributed to the first edition as well as many chapters compiled by new authors. Introducing the reader to strategies and methods in the search for bioactive natural products, this book covers topics including: Natural sources of bioactive compounds such as aquatic cyanobacteria, filamentous fungi, and tropical plants, The tremendous potentiality of metabolic engineering of natural products biosynthesis The contribution of emerging or developing technologies to the study of bioactive natural compounds, namely computational methods and circular dichroism The potential of natural or natural-derived compounds for specific therapeutic applications: treatment of viral diseases, regulation of hypoxia-inducible factor, antimalarials, modulation of angiogenesis, and antitumor and wound-healing activity Selected examples of natural product families and related synthetic analogues, namely polyphenols and camptothecins Compiled for researchers and Ph.D. students working in interdisciplinary fields, this book will also be appreciated by readers without a background in chemistry interested in bioactive natural products, their biological and pharmacological properties, and their possible use as chemopreventive or chemotherapeutic agents. Conversely, the

biological and pharmacological data and methods are accessible by chemists. Advanced technology such as high-throughput screening (HTS) was used in selecting desirable molecules that have the potential to become drug candidates in modern drug discovery. Therefore, suitable libraries should be designed. Many literature sources have shown that most drugs which passed clinical trials were derived from natural sources such as plants. Herbal remedies, derived from plants were used in many countries for a variety of health reasons. In China, there is an extensive history of using herbal medicines to treat diseases or to improve health state, while New Zealand has a relatively short history of using herbal remedies. Most records of using native plants for either medicinal or non-medicinal use were attributed to the M?ori. Due to the history of geographical and climatic changes, New Zealand provides a distinctive and unique biota. Therefore, it can be expected that the flora in New Zealand contain bioactive compounds. This thesis mainly focuses on compiling and analysing a library of bioactive compounds found in native New Zealand medicinal plants, as numerous documented evidences has reflected that natural products are effective. In this research, a total of 474 compounds were investigated to see whether they have the potential in becoming leads in drug discovery and development. The Qikprop software was used to calculate the physiochemical parameters. Each bioactive compound found was categorized into three different chemical spaces: leadlike space, drug-like space and the known drug space, based on the molecular descriptor data. Results showed that 57.5% of the bioactive compounds were in the lead-like space, which suggests the potential of bioactive compounds in herbal remedies in New Zealand.

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