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KEY=OF - LILLY ADALYNN

ANTISENSE DRUG TECHNOLOGY

PRINCIPLES, STRATEGIES, AND APPLICATIONS, SECOND EDITION

CRC Press **Extensively revised and updated, Antisense Drug Technology: Principles, Strategies, and Applications, Second Edition reflects the logarithmic progress made in the past four years of oligonucleotide-based therapies, and, in particular, antisense therapeutics and research. Interpreting lessons learned from the clinical trials of first generation drugs, the book evaluates the technology as a whole and offers new directions and avenues of research and development. Divided into five parts, the book begins with a thorough introduction to the mechanism of antisense drug action including the RNase H mechanism, small RNA silencing pathways, and the potential therapeutics of splice switching oligonucleotides. Leading researchers demonstrate the basics of oligonucleotide therapeutics in part two by delineating medicinal chemistry, pharmacokinetics, and delivery routes such as liposomal formulations for nucleic acid delivery. Part three details hybridization based drugs and considers the dramatic advances represented by 2’ methoxyethyl chimeric antisense inhibitors and duplex RNA drugs. Other chemical classes of drugs and mechanisms of action are described in part four with further discussions on improving the second generation antisense drugs. The final part delves deeply into therapeutic applications. Contributing authors examine the potential of antisense drugs for the alleviation of cardiovascular diseases, metabolic diseases, inflammatory diseases, cancer, neurological**

disorders, and immune modulation. Presenting a highly detailed, lucid discussion of the remarkable advances in the field, Antisense Drug Technology: Principles, Strategies, and Applications, Second Edition provides the platform for researchers to continue to aggressively pursue the great opportunity represented by this exciting technology.

SYNTHESIS AND EVALUATION OF LNA ANALOGUES: [ALPHA]-L-LNA AND 2'-AMINO-LNA

PH.D. THESIS

INDEX MEDICUS

PEPTIDE NUCLEIC ACIDS, MORPHOLINOS AND RELATED ANTISENSE BIOMOLECULES

Springer Science & Business Media **This volume is unique to the existing literature in the Peptide Nucleic Acid field, in that it focuses on comparing and contrasting PNA with other available oligonucleotide homologues and considers areas in which these biomolecules could be profitably applied to clinical and diagnostic applications. Part I of the book addresses comparative strengths and weaknesses of various nucleoside homologues. Part II of the book addresses specific translational or clinical applications for PNA and related antisense biomolecules. The editors have succeeded in presenting a balanced yet broad view of the methods available for gene targeting and modification.**

CHEMICAL SYNTHESIS OF NUCLEOSIDE ANALOGUES

John Wiley & Sons **Compiles current tested and proven approaches tosynthesize novel nucleoside analogues Featuring contributions from leading synthetic chemists fromaround the world, this book brings together and describes testedand proven approaches for the chemical synthesis of common familiesof nucleoside analogues. Readers will learn to create newnucleoside analogues with desired therapeutic properties by using avariety of methods to chemically modify natural nucleosides,including: Changes to the heterocyclic base Modification of substituents at the sugar ring Replacement of the furanose ring by a different carbo- orheterocyclic ring Introduction of conformational restrictions Synthesis of enantiomers Preparation of hydrolitically stable C-nucleosides Chemical Synthesis of Nucleoside Analogues covers all themajor classes of nucleosides, including pronucleotides,C-nucleosides, carbanucleosides, and PNA monomers which have showngreat promise as starting points for the synthesis of nucleosideanalogues. The book also includes experimental procedures for keyreactions related to the synthesis of**

nucleoside analogues,providing a valuable tool for the preparation of a number ofdifferent compounds. Throughout the book, chemical schemes and figures help readersbetter understand the chemical structures of nucleoside analoguesand the methods used to synthesize them. Extensive references serveas a gateway to the growing body of original research studies andreviews in the field. Synthetically modified nucleosides have proven their value astherapeutic drugs, in particular as antiviral and antitumor agents.However, many of these nucleoside analogues have undesirable sideeffects. With Chemical Synthesis of Nucleoside Analogues astheir guide, researchers have a new tool for synthesizing a newgeneration of nucleoside analogues that can be used as therapeuticdrugs with fewer unwanted side effects.

ENZYMATIC AND CHEMICAL SYNTHESIS OF NUCLEIC ACID DERIVATIVES

John Wiley & Sons **A review of innovative tools for creative nucleic acid chemists that open the door to novel probes and therapeutic agents Nucleic acids continue to gain importance as novel diagnostic and therapeutic agents. With contributions from noted scientists and scholars, Enzymatic and Chemical Synthesis of Nucleic Acid Derivatives is a practical reference that includes a wide range of approaches for the synthesis of designer nucleic acids and their derivatives. The book covers enzymatic (including chemo-enzymatic) methods, with a focus on the synthesis and incorporation of modified nucleosides. The authors also offer a review of innovative approaches for the non-enzymatic chemical synthesis of nucleic acids and their analogs and derivatives, highlighting especially challenging species. The book offers a concise review of the methods that prepare novel and heavily modified polynucleotides in sufficient amount and purity for most clinical and research applications. This important book: -Presents a timely and topical guide to the synthesis of designer nucleic acids and their derivatives -Addresses the growing market for nucleotide-derived pharmaceuticals used as anti-infectives and chemotherapeutic agents, as well as fungicides and other agrochemicals. -Covers novel methods and the most recent trends in the field -Contains contributions from an international panel of noted scientistics Written for biochemists, medicinal chemists, natural products chemists, organic chemists, and biotechnologists, Enzymatic and Chemical Synthesis of Nucleic Acid Derivatives is a practice-oriented guide that reviews innovative methods for the enzymatic as well as non-enzymatic synthesis of nucleic acid species.**

ISSUES IN CHEMISTRY AND GENERAL CHEMICAL RESEARCH: 2012 EDITION

ScholarlyEditions **Issues in Chemistry and General Chemical Research: 2012 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Chirality. The editors have built Issues in Chemistry and General Chemical Research: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Chirality in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Chemistry and General Chemical Research: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.**

SEQUENCE-CONTROLLED POLYMERS

John Wiley & Sons **Edited by a leading authority in the field, the first book on this important and emerging topic provides an overview of the latest trends in sequence-controlled polymers. Following a brief introduction, the book goes on to discuss various synthetic approaches to sequence-controlled polymers, including template polymerization, genetic engineering and solid-phase chemistry. Moreover, monomer sequence regulation in classical polymerization techniques such as step-growth polymerization, living ionic polymerizations and controlled radical polymerizations are explained, before concluding with a look at the future for sequence-controlled polymers. With its unique coverage of this interdisciplinary field, the text will prove invaluable to polymer and environmental chemists, as well as biochemists and bioengineers.**

PHENALENES—ADVANCES IN RESEARCH AND APPLICATION: 2012 EDITION

SCHOLARLYPAPER

ScholarlyEditions **Phenalenes—Advances in Research and Application: 2012 Edition is a ScholarlyPaper™ that delivers timely, authoritative, and intensively focused information about Phenalenes in a compact format. The editors have built Phenalenes—Advances in Research and Application: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Phenalenes in this eBook to be deeper than what you can**

access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Phenalenes—Advances in Research and Application: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

MOLECULAR ARCHITECTONICS AND NANOARCHITECTONICS

Springer Nature **This book is the ultimate assembly of recent research activities on molecular architectonics and nanoarchitectonics by authors who are worldwide experts. The book proposes new ways of creating functional materials at the nano level using the concepts of molecular architectonics and nanoarchitectonics, which are expected to be the next-generation approaches beyond conventional nanotechnology. All the contents are categorized by types of materials, organic materials, biomaterials, and nanomaterials. For that reason, non-specialists including graduate and undergraduate students can start reading the book from any points they would like. Cutting-edge trends in nanotechnology and material sciences are easily visible in the contents of the book, which is highly useful for both students and experimental materials scientists.**

SYNTHESIS, BIOPHYSICAL PROPERTIES AND APPLICATIONS OF N-FUNCTIONALIZED DERIVATIVES OF 2'-AMINO-(ALFA)-L-LNA.

RNA NANOTECHNOLOGY AND THERAPEUTICS

CRC Press **Interest in RNA nanotechnology has increased in recent years as recognition of its potential for applications in nanomedicine has grown. Edited by the world's foremost experts in nanomedicine, this comprehensive, state-of-the-art reference details the latest research developments and challenges in the biophysical and single molecule approaches in RNA nanotechnology. In addition, the text also provides in-depth discussions of RNA structure for nanoparticle construction, RNA computation and modeling, single molecule imaging of RNA, RNA nanoparticle assembly, RNA nanoparticles in therapeutics, RNA chemistry for nanoparticle synthesis, and conjugation and labeling.**

FRONTIERS IN CLINICAL DRUG RESEARCH: HIV

Bentham Science Publishers **Frontiers in Clinical Drug Research – HIV is an eBook series that brings updated reviews to readers interested in learning about advances in the development of pharmaceutical agents for the treatment of acquired immune deficiency syndrome (AIDS) and other disorders associated with human immunodeficiency virus (HIV) infection. The scope of the eBook series covers a range of topics including the medicinal chemistry and pharmacology of natural and synthetic drugs employed in the treatment of AIDS (including HAART) and resulting complications, and the virology and immunological study of HIV and related viruses. Frontiers in Clinical Drug Research – HIV is a valuable resource for pharmaceutical scientists, clinicians and postgraduate students seeking updated and critically important information for developing clinical trials and devising research plans in HIV/AIDS research. The first volume of this series features 7 chapters that cover a variety of topics including: -Antiretroviral drug development -HIV-1 genomics -HIV drug targets such as ribosomes and HIV Integrase -HAART associated nephrotoxicity**

ORGANOPHOSPHORUS CHEMISTRY

Royal Society of Chemistry **Coverage in this annual review of the literature presents a comprehensive and critical survey of the vast field of study involving organophosphorus compounds, from phosphines and phosphonium salts through to phosphorus acid derivatives, nucleotides, ylides and phosphazenes. The critical reviews in this volume enable industrial and academic researchers to keep abreast of the latest developments in their specialist fields.**

CALORIMETRY

Academic Press **Calorimetry, the latest volume in the Methods in Enzymology series continues the legacy of this premier serial with quality chapters authored by leaders in the field. Calorimetry is a highly technical experiment and it is easy for new practioners to get fooled into interpreting artifacts as real experimental results. This volume will guide readers to get the most out of their precious biological samples and includes topics on specific protocols for the types of studies being conducted as well as tips to improve the data collection. Most importantly, the chapters will also help to identify pitfalls that need to be avoided to ensure that the highest quality results are obtained. Contains timely contributions from recognized experts in this rapidly changing field Provides specific protocols and tips to improve data collection and ensure the highest quality results are obtained Covers research methods in calorimetry, and includes sections on topics such as differential scanning calorimetry of membrane and soluble proteins in detergents.**

THE CHEMICAL BIOLOGY OF NUCLEIC ACIDS

John Wiley & Sons **With extensive coverage of synthesis techniques and applications, this text describes chemical biology techniques which have gained significant impetus during the last five years. It focuses on the methods for obtaining modified and native nucleic acids, and their biological applications. Topics covered include: chemical synthesis of modified RNA expansion of the genetic alphabet in nucleic acids by creating new base pairs chemical biology of DNA replication: probing DNA polymerase selectivity mechanisms with modified nucleotides nucleic-acid-templated chemistry chemical biology of peptide nucleic acids (PNA) the interactions of small molecules with DNA and RNA the architectural modules of folded RNAs genesis and biological applications of locked nucleic acid (LNA) small non-coding RNA in bacteria microRNA-guided gene silencing nucleic acids based therapies innate immune recognition of nucleic acid light-responsive nucleic acids for the spatiotemporal control of biological processes DNA methylation frameworks for programming RNA devices RNA as a catalyst: The Diels-Alderase-Ribozyme evolving an understanding of RNA function by in vitro approaches the chemical biology of aptamers: synthesis and applications nucleic acids as detection tools bacterial riboswitch discovery and analysis The Chemical Biology of Nucleic Acids is an essential compendium of the synthesis of nucleic acids and their biological applications for bioorganic chemists, chemical biologists, medicinal chemists, cell biologists, and molecular biologists.**

CYCLIC HYDROCARBONS—ADVANCES IN RESEARCH AND APPLICATION: 2012 EDITION

SCHOLARLYBRIEF

ScholarlyEditions **Cyclic Hydrocarbons—Advances in Research and Application: 2012 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about Cyclic Hydrocarbons in a concise format. The editors have built Cyclic Hydrocarbons—Advances in Research and Application: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Cyclic Hydrocarbons in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Cyclic Hydrocarbons—Advances in Research and Application: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More**

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CHEMOSELECTIVE AND BIOORTHOGONAL LIGATION REACTIONS

CONCEPTS AND APPLICATIONS

John Wiley & Sons **This timely, one-stop reference is the first on an emerging and interdisciplinary topic. Covering both established and recently developed ligation chemistries, the book is divided into two didactic parts: a section that focuses on the details of bioorthogonal and chemoselective ligation reactions at the level of fundamental organic chemistry, and a section that focuses on applications, particularly in the areas of chemical biology, biomaterials, and bioanalysis, highlighting the capabilities and benefits of the ligation reactions. With chapters authored by outstanding scientists who range from trailblazers in the field to young and emerging leaders, this book on a highly interdisciplinary topic will be of great interest for biochemists, biologists, materials scientists, pharmaceutical chemists, organic chemists, and many others.**

APTAMERS FOR ANALYTICAL APPLICATIONS

AFFINITY ACQUISITION AND METHOD DESIGN

Wiley-VCH **An essential guide that puts the focus on method developments and applications in aptamers In recent years, aptamer-based systems have been developed for a wide-range of analytical and medical applications. Aptamers for Analytical Applications offers an introduction to the topic, outlines the common protocols for aptamer synthesis, as well as providing information on the different optimization strategies that can obtain higher affinities to target molecules. The contributors?noted experts on the topic?provide an in-depth review of the characterization of aptamer-target molecule interaction and immobilization strategies and discuss the developments of methods for all the relevant applications. The book outlines different schemes to efficiently immobilize aptamers on substrates as well as summarizing the characterization methods for aptamer-ligand complexes. In addition, aptamer-based colorimetric, enzyme-linked, fluorescent, electrochemical, lateral flow and non-labeling analytical methods are presented. The book also reflects state-of-the-art and emerging applications of aptamer-based methods. This important resource: -Provides a guide to aptamers which provide highly specific and sensitive molecular recognition, with affinities in the range of antibodies and are much cheaper to produce -Offers a discussion of the analytical method developments and**

improvements with established systems and beyond -Offers a comprehensive guide to all the relevant application areas -Presents an authoritative book from contributors who are noted experts in the field Written for analytical chemists, biochemists, analytical researchers, Aptamers for Analytical Applications is a comprehensive book that adopts a methodological point of view to the important aspects of aptamer generation and modification with a strong emphasis on method developments for relevant applications.

SYNTHESIS AND CHARACTERIZATION OF ENERGETICALLY ACTIVATED DUPLEXES FOR SEQUENCE-UNRESTRICTED RECOGNITION OF DOUBLE-STRANDED DNA

The main purpose of the work described in this dissertation is to develop oligonucleotide-based probes that can target genomic DNA. The development of probes capable of interrupting the flow of genetic information in living organisms have become an interesting field of research due to their potential as diagnostic and fundamental research tools, and -- the grand challenge -- therapeutics that can combat diseases of genetic origin. There is an extensive need to expand the current toolbox of double-stranded DNA (dsDNA) targeting probes to enable high specificity targeting at physiologically relevant conditions without sequence limitations. The Hrdlicka lab focuses on the development of a novel DNA targeting methodology utilizing energetically activated DNA duplexes, which potentially overcome the limitations of current DNA recognition strategies (e.g., triplex-forming oligonucleotides, polyamides, and peptide nucleic acids). This approach originally utilized N2'-pyrene-functionalized 2'-amino-[alpha]-L-LNA nucleotides as the key activating modifications. However, these building blocks are synthetically difficult to make impeding the full characterization of this novel DNA recognition strategy. Identification of simpler and more readily accessible scaffolds therefore presented itself as a highly desirable goal in order to conduct structure-property relationship studies with the aim of optimizing the dsDNA binding affinity of Invader probes. The work presented in this dissertation describes the synthesis and characterization of oligonucleotides and Invader probes based on (i) N2'-pyrene-functionalized 2'-amino-[alpha]-L-LNA adenosine, (ii) N2'-pyrene-/perylene-/coronene-functionalized 2'-N-methyl-2'-aminouridine monomers, to study the influence of intercalator size on dsDNA recognition efficiency, (iii) phosphorothioate DNA backbones, to improve pharmacokinetic properties, (iv) S2'-pyrene-functionalized 2'-thiouridine, to study the effect of electronegativity of the 2'-sugar atom on DNA recognition efficiency, (v) pseudo-complementary Invader building blocks, to further increase the binding affinity of Invader probes. The long-term goal of this research project is to develop simple nucleic acid probes that allow for sequence-unrestricted targeting of double-stranded DNA and to apply

these probes as tools in molecular biology, nucleic acid diagnostics, and novel gene therapeutics.

ORGANOPHOSPHORUS CHEMISTRY

Organophoshorus Chemistry provides a comprehensive and critical review of the recent literature. Coverage includes phosphines and their chalcogenides, phosphonium salts, low coordination number phosphorus compounds, penta- and hexa- coordinated compounds, tervalent phosphorus acid derivatives, quiquevalent phosphorus acids, nucleotides and nucleic aicds, ylides and related compounds, phosphazenes and the application of physical methods in the study of organophosphorus compounds. This Specialist Periodical Report will be of value to research workers in universities, government and industrial research organisations whose work involves the use of organophosphorus compounds. It provides a concise but comprehensive survey of a vast field of study, with a wide variety of applications, enabling the reader to keep abreast of the latest developments in their specialist fields.

SYNTHESIS OF THERAPEUTIC OLIGONUCLEOTIDES

Springer **This book presents the latest knowledge on a broad range of topics relating to the synthesis of natural and artificial oligonucleotides with therapeutic potential. Nucleic acid-based therapeutics are attracting much attention, and numerous therapeutic oligonucleotides, such as antisense oligonucleotides, siRNAs, splice-switching oligonucleotides, and nucleic acid aptamers, are being evaluated in clinical trials for the treatment of a variety of diseases. Synthesis of Therapeutic Oligonucleotides covers a broad range of topics in the field that are of high relevance to researchers, including the synthesis of natural and chemically modified oligonucleotides, the development of novel nucleic acid analogs, industrial scale synthesis and purification of oligonucleotides, and important aspects of chemistry, manufacturing, and controls (CMC). The aim is to provide new insights and inspire fresh ideas in nucleic acid chemistry that may ultimately lead to novel concepts and techniques and the discovery of more effective nucleic acid drugs. The book will be of high value for both established researchers in the field and students intending to specialize in nucleic acid chemistry research.**

MODIFIED NUCLEIC ACIDS

Springer **This book spans diverse aspects of modified nucleic acids, from chemical synthesis and spectroscopy to in vivo applications, and highlights studies on chemical modifications of the backbone and nucleobases. Topics discussed**

include fluorescent pyrimidine and purine analogs, enzymatic approaches to the preparation of modified nucleic acids, emission and electron paramagnetic resonance (EPR) spectroscopy for studying nucleic acid structure and dynamics, non-covalent binding of low- and high-MW ligands to nucleic acids and the design of unnatural base pairs. This unique book addresses new developments and is designed for graduate level and professional research purposes.

CUMULATED INDEX MEDICUS

MODIFIED NUCLEOSIDES

IN BIOCHEMISTRY, BIOTECHNOLOGY AND MEDICINE

John Wiley & Sons **Edited by one of the main driving forces behind the field's momentous rise in recent years, this one-stop reference is the first comprehensive resource to integrate recent advances. The first part addresses biochemical aspects and applications, the second and third parts are devoted to compounds with therapeutic potential, with the third part focusing on newly introduced anticancer nucleoside drugs. Essential reading for every scientist working in this area.**

APTAMERS

MDPI **This book is a printed edition of the Special Issue " Aptamers" that was published in IJMS**

NANOMATERIALS AND THEIR INTERACTIVE BEHAVIOR WITH BIOMOLECULES, CELLS AND TISSUES

Bentham Science Publishers **Nanoscience is a multidisciplinary area of science which enables researchers to create tools that help in understanding the mechanisms related to the interactions between nanomaterials and biomolecules (nanotechnology). Nanomaterials represent nanotechnology products. These products have an enormous impact on technical industries and the quality of human life. Nanomaterials directly or indirectly have to interact with biosystems. It is, therefore, essential to understand the beneficial and harmful interactions of nanomaterials with and within a biosystem, especially with reference to humans. This book provides primary and advanced information concerning the interactions between nanomaterials and the components of a typical biosystem to readers. Chapters in the book cover, in a topic-based approach, the many facets of nanomolecular interactions with biological molecules and systems that influence their behavior, bioavailability and biocompatibility (including nucleic acids, cell**

membranes, tissues, enzymes and antibodies). A note on the applications of nanomaterials is also presented in the conclusion of the book to illustrate the usefulness of this class of materials. The contents of the book will benefit students, researchers, and technicians involved in the fields of biological sciences, such as cell biology, medicine, molecular biology, food technology, cosmetology, pharmacology, biotechnology, and environmental sciences. The book also provides information for the material science personnel, enabling them to understand the basics of target-oriented nanomaterials design for specific objectives.

ORGANOPHOSPHORUS CHEMISTRY

Royal Society of Chemistry **A series of critical reviews and perspectives focusing on how specific aspects of organometallic chemistry interface with other fields of study.**

CHEMICAL BIOLOGY OF NUCLEIC ACIDS

FUNDAMENTALS AND CLINICAL APPLICATIONS

Springer Science & Business **This volume contains 29 engrossing chapters contributed by worldwide, leading research groups in the field of chemical biology. Topics include pre-biology; the establishment of the genetic code; isomerization of RNA; damage of nucleobases in RNA; the dynamic structure of nucleic acids and their analogs in DNA replication, extra- and intra-cellular transport; molecular crowding by the use of ionic liquids; new technologies enabling the modification of gene expression via editing of therapeutic genes; the use of riboswitches; the modification of mRNA cap regions; new approaches to detect appropriately modified RNAs with EPR spectroscopy and the use of parallel and high-throughput techniques for the analysis of the structure and new functions of nucleic acids. This volume discusses how chemistry can add new frontiers to the field of nucleic acids in molecular medicine, biotechnology and nanotechnology and is not only an invaluable source of information to chemists, biochemists and life scientists but will also stimulate future research.**

MEDICINAL CHEMISTRY OF NUCLEIC ACIDS

John Wiley & Sons **Complete, up-to-date coverage of the broad area of nucleic acid chemistry and biology Assembling contributions from a collection of authors with expertise in all areas of nucleic acids, medicinal chemistry, and**

therapeutic applications, Medicinal Chemistry of Nucleic Acids presents a thorough overview of nucleic acid chemistry—a rapidly evolving and highly challenging discipline directly responsible for the development of antiviral and antitumor drugs. This reliable resource delves into a multitude of subject areas involving the study of nucleic acids—such as the new advances in genome sequencing, and the processes for creating RNA interference (RNAi) based drugs—to assist pharmaceutical researchers in removing roadblocks that hinder their ability to predict drug efficacy. Offering the latest cutting-edge science in this growing field, Medicinal Chemistry of Nucleic Acids includes: In-depth coverage of the development and application of modified nucleosides and nucleotides in medicinal chemistry A close look at a large range of current topics on nucleic acid chemistry and biology Essential information on the use of nucleic acid drugs to treat diseases like cancer A thorough exploration of siRNA for RNAi and the regulation of microRNA, non-coding RNA (ncRNA), a newly developing and exciting research area Thorough in its approach and promising in its message, Medicinal Chemistry of Nucleic Acids probes the new domains of pharmaceutical research—and exposes readers to a wealth of new drug discovery opportunities emerging in the dynamic field of nucleic acid chemistry.

NUCLEIC ACIDS IN CHEMISTRY AND BIOLOGY

Royal Society of Chemistry **The structure, function and reactions of nucleic acids are central to molecular biology and are crucial for the understanding of complex biological processes involved. Revised and updated Nucleic Acids in Chemistry and Biology 3rd Edition discusses in detail, both the chemistry and biology of nucleic acids and brings RNA into parity with DNA. Written by leading experts, with extensive teaching experience, this new edition provides some updated and expanded coverage of nucleic acid chemistry, reactions and interactions with proteins and drugs. A brief history of the discovery of nucleic acids is followed by a molecularly based introduction to the structure and biological roles of DNA and RNA. Key chapters are devoted to the chemical synthesis of nucleosides and nucleotides, oligonucleotides and their analogues and to analytical techniques applied to nucleic acids. The text is supported by an extensive list of references, making it a definitive reference source. This authoritative book presents topics in an integrated manner and readable style. It is ideal for graduate and undergraduates students of chemistry and biochemistry, as well as new researchers to the field.**

TEMPLATED DNA NANOTECHNOLOGY

FUNCTIONAL DNA NANOARCHITECTONICS

CRC Press **Nucleic acids have structurally evolved over billions of years to effectively store and transfer genetic information. In the 1980s, Nadrian Seeman’s idea of constructing a 3D lattice from DNA led to utilizing DNA as nanomolecular building blocks to create emergent molecular systems and nanomaterial objects. This bottom-up approach to construct nanoscale architectures with DNA marked the beginning of a new field, DNA nanotechnology, contributing significantly to the broad area of nanoscience and nanotechnology. The molecular architectonics of small "designer" molecules and short DNA sequences through complementary binding interaction engenders well-defined functional nanoarchitectures with realistic applications in areas ranging from biology to materials science and is termed "DNA nanoarchitectonics." This book discusses novel approaches adapted by leading researchers from all over the world to create functional nucleic acid molecular systems and nanoarchitectures. Individual chapters contributed by active practitioners provide fundamental and advanced knowledge emanated from their own and others’ work. Each chapter includes numerous illustrations, historical perspectives, case studies and practical examples, critical discussions, and future prospects. This book can serve as a practical handbook or as a textbook for advanced undergraduate- and graduate-level students of nanotechnology and DNA nanotechnology, supramolecular chemistry, and nanoarchitectonics and researchers working on macromolecular science, nanotechnology, chemistry, biology, and medicine, especially those with an interest in sensors, biosensors, nanoswitches and nanodevices, diagnostics, drug delivery, and therapeutics.**

BIOTECHNOLOGY OF MICROBIAL ENZYMES

PRODUCTION, BIOCATALYSIS AND INDUSTRIAL APPLICATIONS

Academic Press **Biotechnology of Microbial Enzymes: Production, Biocatalysis and Industrial Applications provides a complete survey of the latest innovations on microbial enzymes, highlighting biotechnological advances in their production and purification along with information on successful applications as biocatalysts in several chemical and industrial processes under mild and green conditions. Applications of microbial enzymes in food, feed, and pharmaceutical industries are given particular emphasis. The application of recombinant DNA technology within industrial fermentation and the production of enzymes over the last 20 years have produced a host of useful chemical and biochemical substances. The power of these technologies results in novel transformations, better enzymes, a wide**

variety of applications, and the unprecedented development of biocatalysts through the ongoing integration of molecular biology methodology, all of which is covered insightfully and in-depth within the book. Features research on microbial enzymes from basic science through application in multiple industry sectors for a comprehensive approach Includes information on metabolic pathway engineering, metagenomic screening, microbial genomes, extremophiles, rational design, directed evolution, and more Provides a holistic approach to the research of microbial enzymes

ORGANOPHOSPHORUS CHEMISTRY

Royal Society of Chemistry **Organophosphorus Chemistry provides a comprehensive and critical review of the recent literature. Coverage includes phosphines and their chalcogenides, phosphonium salts, low coordination number phosphorus compounds, penta- and hexa- coordinated compounds, quiquevalent phosphorus acids, nucleotides and nucleic aicds, ylides and related compounds, phosphazenes and the application of physical methods in the study of organophosphorus compounds. This is the 40th in a series of volumes which first appeared in 1970 under the editorship of Stuart Trippett and which covered the literature of organophosphorus chemistry published in the period from January 1968 to June 1969, citing some 1370 publications. The present volume covers the literature from January 2009 to January 2010, citing more than 2200 publications, continuing our efforts to provide an up to date survey of progress in an area of chemistry that has expanded significantly over the past 40 years.**

ADVANCED TECHNOLOGIES FOR MEAT PROCESSING

CRC Press **In recent years, the meat industry has incorporated important technological advances that, to this point, have not been addressed in a single source. Comprehensive and authoritative, Advanced Technologies for Meat Processing presents developments concerning the quality, analysis, and processing of meat and meat products. Co-Edited by Fidel Toldra - Recipient of the 2010 Distinguished Research Award from the American Meat Science Association Featuring contributions from a panel of international experts, the book details technologies used in the meat processing chain. It describes important processing methodologies such as gene technology, automation, irradiation, hot boning, high pressure, vacuum-salting, enzymes, starters, and bacteriocins. The book begins by exploring various production systems that include the use of modern biotechnology, automation in slaughterhouses, and rapid non-destructive on-line detection systems. It proceeds to describe different new technologies such as decontamination, high pressure processing, and fat reduction. The book then examines functional meat compounds**

such as peptides and antioxidants and the processing of nitrate-free products and dry-cured meat products. It also discusses bacteriocins that fight against meat-borne pathogens and the latest developments in bacterial starters for improved flavor in fermented meats. It concludes with a discussion of packaging systems of the final products.

ISSUES IN CHEMISTRY AND GENERAL CHEMICAL RESEARCH: 2011 EDITION

ScholarlyEditions **Issues in Chemistry and General Chemical Research: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Chemistry and General Chemical Research. The editors have built Issues in Chemistry and General Chemical Research: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Chemistry and General Chemical Research in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Chemistry and General Chemical Research: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.**

OLIGONUCLEOTIDE-BASED THERAPIES

METHODS AND PROTOCOLS

Humana **This book provides a collection of comprehensive, up-to-date, and broadly applicable guides to the research and development fields of oligonucleotide (ON) therapeutics. Covering topics from the study of antisense and anti-gene effects to oligonucleotides in the context of drug discovery and development, the volume explores a wide-ranging and useful spectrum of methods and protocols needed to take full advantage of therapeutic applications involving ONs. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Oligonucleotide-Based Therapies: Methods and Protocols aims to be a great aid in the laboratory as well as an ideal reference guide when designing antisense and anti-gene oligonucleotides for therapeutic applications.**

THERAPEUTIC OLIGONUCLEOTIDES

Royal Society of Chemistry **This book provides a comprehensive overview of the development of therapeutic oligonucleotides for therapeutic applications, touching on a number of additional oligonucleotides including a number of small interfering RNAs currently in various phases of clinical development. Written by leading expert scientists from both academia and leading biotechnical companies, the authors provide a compelling update on current status of RNA interference with emphasis on fascinating topics including oligonucleotides: antisense oligonucleotides, ribozymes, siRNAs, decoy oligonucleotides and aptamers. This exceptional work will be a valid resource for researchers and students as well as academia, consultants and scientists.**

RNA AND DNA DIAGNOSTICS

Springer **The aim of molecular diagnostics is preferentially to detect a developing disease before any symptoms appear. There has been a significant increase, fueled by technologies from the human genome project, in the availability of nucleic acid sequence information for all living organisms including bacteria and viruses. When combined with a different type of instrumentation applied, the resulting diagnostics is specific and sensitive. Nucleic acid-based medical diagnosis detects specific DNAs or RNAs from the infecting organism or virus and a specific gene or the expression of a gene associated with a disease. Nucleic acid approaches also stimulate a basic science by opening lines of inquiry that will lead to greater understanding of the molecules at the center of life. One can follow Richard Feynman's famous statement "What I cannot create, I do not understand."**

METALLOFOLDAMERS

SUPRAMOLECULAR ARCHITECTURES FROM HELICATES TO BIOMIMETICS

John Wiley & Sons **Metallofoldamers are oligomers that fold into three-dimensional structures in a controlled manner upon coordination with metal ions. Molecules in this class have shown an impressive ability to form single-handed helical structures and other three-dimensional architectures. Several metallofoldamers have been applied as sensors due to their selective folding when binding to a specific metal ion, while others show promise for applications as responsive materials on the basis of their ability to fold and unfold upon changes in the oxidation state of the coordinated metal ion, and as novel catalysts. Metallofoldamers: From Helicates to Biomimetic Architectures describes**

the variety of interactions between oligomers and metal species, with a focus on non-natural synthetic molecules. Topics covered include: the major classes of foldamers and their folding driving force metalloproteins and metalloenzymes helicates: self-assembly, structure and applications abiotic metallo-DNA metallo-PNA and iDNA metallopeptides interactions of biomimetic oligomers with metal ions applications of metallofoldamers