Synthesis and Evaluation of LNA Analogues: (alpha)-L-LNA and 2'-amino-LNA-Mads Detlef Sørensen 2003

Antisense Drug Technology-Stanley T. Crooke 2007-07-25 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 provides a platform for researchers to continue to aggressively pursue the great opportunity presented by this exciting technology.

Peptide Nucleic Acids, Morpholinos and Related Antisense Biomolecules-Christopher Janson 2007-03-06 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 nucleic acid 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.


Synthesis of Therapeutic Oligonucleotides-Satoshi Ohika 2018-12-08 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.

Nucleic Acids in Chemistry and Biology-G Michael Blackburn 2015-11-09 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.

Therapeutic Oligonucleotides-Jens Kurreck 2008 This book provides a compelling overall update on current status of RNA interference

Bulletin of the Chemical Society of Japan-Nihon Kagakkai 2009

Oligonucleotide-Based Therapies-Olof Gissberg 2020-08-15 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.

Synthesis and Characterization of Energetically Activated Duplexes for Sequence-unrestricted Recognition of Double-stranded DNA-Brooke Alyssa Anderson 2015 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, polynucleotides, 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 and impose 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-/pyrene-perylene-coronene-functionalized 2'-N-methyl-2'-
aminoaridine 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.

The Apmter Handbook—Sven Klahnbaum 2006-06-21 In The Apmter Handbook, leading scientists from academia as well as biotech and pharma companies introduce the revolutionary concept of designing RNA and DNA oligonucleotides with novel functions by in vitro selection. These functions comprise high affinity binding (aptamers), catalytic activity (ribozymes and deoxyribozymes) or combinations of binding and catalytic properties (aptazymes). Basic concepts and technologies describing in detail how these functional oligonucleotides can be identified are presented. Numerous examples demonstrate the versatility of in vitro selected oligonucleotides. Special emphasis has been put on a section that shows the broad applicability of aptamers, e. g. in target validation, for analytics, or as new therapeutics. This first overview in the field is of prime interest for a broad audience of scientists both in academia and in industry who wish to expand their knowledge on the potential of new oligonucleotide functions and their applications.

Wiley Encyclopedia of Chemical Biology, 4 Volume Set—Tadhg P. Begley 2009 The Wiley Encyclopedia of Chemical Biology is an authoritative new work whose goal is to illuminate the crucial role of chemistry and chemical techniques in the life sciences. The encyclopedia will adopt an inclusive editorial approach, encompassing fundamental and blue-sky science as well as those areas of research that have more immediate medical or commercial applications. The scope and structure of the work will reflect the multidimensional character of chemical biology, focusing in particular on the fundamental science of biological structures and systems, the use of chemical and biological techniques to elucidate that science, and the applications of this knowledge in areas as diverse as drug discovery, sensor technology, and catalysis. Major topics areas covered in the encyclopedia: Chemical Views of Biology Biomolecules within the Cell Chemistry of Biological Processes Progenial Biology of Cellular Compartments Synthetic Molecules as Tools for Chemical Biology Technologies and Techniques in Chemical Biology Applications of Chemical Biology

Nucleic Acid Aptamers—Günter Mayer 2015-11-10 This volume provides protocol references covering recent developments in the aptamer field. Within the last decade, aptamers have become more and more popular, and their sophisticated biophysical properties together with their ability to be easily modified and, thus, adapted to various regimens makes them a very promising class of compounds. Divided into three sections, the book covers selection, a series of analytical methods to assess biophysical properties of aptamer-target interactions, as well as various applications of aptamers. 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. Practical and easy to follow, Nucleic Acid Aptamers: Selection, Characterization, and Application provides a state-of-the-art summary of recent developments in the aptamer field and will be a helpful resource for scientists in the life sciences working with aptamers as tools to elucidate biological systems.

Organophosphorus Chemistry—J. C. Teby 2010-03 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 hex-coordinated compounds, tervalent phosphorus acid derivatives, quinquevalent phosphorus acids, nucleotides and nucleic acids 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.

Polystyrene—Cole Lynnwood 2014-01-01 Polystyrene represents one of the oldest and the most widespread polymers in the world. Its starts as far back as 1839 when a German apothecary Edmon Simon distilled an oily liquid named styrol from the resin of Turkish sweet gum trees. In several days, the steroid converted into a jelly product that he thought resulted from the oxidation process. For that reason, the jelly product received the name styrolxide. This book discusses the synthesis of polystyrene, as well as the characteristics and applications of this polymer.

DNA Conjugates and Sensors—Keith R. Fox 2012-11-30 Applications of nucleic acids have developed recently to provide solutions for biosensors, diagnostic tools and as platforms for the assembly of complex structures. These developments have been possible as their base sequence can be used to assemble precise structures following simple and predictable rules. Self-assembled DNA can then be amplified using polymerase chain reaction (PCR) and this ultimately enables the preparation of synthetic nucleic acids. Their use as molecular tools or DNA-conjugates has recently been enhanced by the addition of other groups including enzymes, fluorophores and small molecules. Written by leaders in the field, this volume describes the preparation and application of these DNA-conjugates. Several have been used as sensors (aptamers, riboswitches and nanostructures) based on the ability of nucleic acids to adopt specific structures in the presence of ligands, whilst others link reporter groups such as fluorophores to RNA or DNA for detection, single molecule studies, and increasing the sensitivity of PCR. The book is relevant to researchers in areas related to analytical chemistry, chemical biology, medicinal chemistry, molecular pharmacology and, structural and molecular biology.

A Visual Analogy Guide to Human Anatomy & Physiology—Paul A. Krieger 2017-02-01 The Visual Analogy Guide to Human Anatomy & Physiology, 3e is an affordable and effective study aid for students enrolled in an introductory anatomy and physiology sequence of courses. This book uses visual analogies to assist the student in learning the details of human anatomy and physiology. Using these analogies, students can take things they already know from experiences in everyday life and apply them to anatomical structures and physiological concepts with which they are unfamiliar. The study guide offers a variety of learning activities for students such as, labeling diagrams, creating their own drawings, or...
coloring existing black-and-white illustrations to better understand the material presented.

Fluorescence Methods and Applications-Otto S. Wolfbeiss 2008-07-01 This volume features papers on new spectroscopic methods and techniques, the development and application of fluorescence probes, and new techniques and applications of fluorescence imaging. Specific areas include the following: fluorescence lifetime, fluorescence (in vivo) imaging, time-resolved fluorescence, luminescence anisotropy, fluorescence (NMR) labels, luminescent lanthanides, fluorescence sensors and probes, fluorescence microscopy, FRET, fluorescent nanoparticles and dots, high-throughput screening, fluorescent bioassays, luminescence-based DNA technologies, FISH and immunohistochemistry, luminescence on metal surfaces, fluorescent proteins, upconversion, multiphoton fluorescence, confocal techniques, near-field and far-field techniques, single photon counting, fluorescence correlation spectroscopy (FCS), and flow cytometry. NOTE: Annals volumes are available for sale as individual books or as a journal. For information on institutional journal subscriptions, please visit www.blackwellpublishing.com/nyas. ACADEMY MEMBERS: Please contact the New York Academy of Sciences directly to place your order (www.nyas.org). Members of the New York Academy of Science receive full-text access to the Annals online and discounts on print volumes. Please visit http://www.nyas.org/MemberCenterJoin.aspx for more information about becoming a member.

Animal Biotechnology-Ashish S. Verma 2020-07-03 Animal Biotechnology: Models in Discovery and Translation, Second Edition, provides a helpful guide to anyone seeking a thorough review of animal biotechnology and its application to human disease and welfare. This updated edition covers vital fundamentals, including in experimental techniques in biomolecular analysis, epigenetics and animal models, gene expression, and ethics and safety concerns, along with in-depth examples of implications for human health and prospects for the future. New chapters cover animal biotechnology as applied to various disease types and research areas, including in vitro fertilization, human embryonic stem cell research, biosensors, enteric diseases, biopharming, organ transplantation, tuberculosis, neurodegenerative disorders, and more. Highlights the latest biomedical applications of genetically modified and cloned animals, with a focus on cancer and infectious diseases Offers first-hand accounts of the use of biotechnology tools, including molecular markers, stem cells, animal cultures, tissue engineering, ADME and CAM Assay Incorporates case studies that illustrate safety assessment issues, ethical considerations, and intellectual property rights associated with the translation of animal biotechnology studies.

Heterocycles- 2007

Innovations in Biomolecular Modeling and Simulations-Tamar Schlick 2012 The chemical and biological sciences face unprecedented opportunities in the 21st century. A confluence of factors from parallel universes - advances in experimental techniques in biomolecular structure determination, progress in theoretical modeling and simulation for large biological systems, and breakthroughs in computer technology - has opened new avenues of opportunity as never before. Now, experimental data can be interpreted and further analysed by modeling, and predictions from any approach can be tested and advanced through companion methodologies and technologies. This two volume set describes innovations in biomolecular modeling and simulation, in both the algorithmic and application fronts. With contributions from experts in the field, the books describe progress and innovation in areas including: simulation algorithms for dynamics and enhanced configurational sampling, force field development, implicit solvent models, coarse-grained models, quantum-mechanical simulations, protein folding, DNA polymerase mechanisms, nucleic acid complexes and simulations, RNA structure analysis and design and other important topics in structural biology modeling. The books are aimed at graduate students and experts in structural biology and chemistry and the emphasis is on reporting innovative new approaches rather than providing comprehensive reviews on each subject.

The Limits of Organic Life in Planetary Systems-National Research Council 2007-07-26 The search for life in the solar system and beyond has to date been governed by a model based on what we know about life on Earth (terrestrial). Most of NASA's mission planning is focused on locations where liquid water is possible and emphasizes searches for structures that resemble cells in terrestrial organisms. It is possible, however, that life exists that is based on chemical reactions that do not involve carbon compounds, that occurs in solvents other than water, or that involves oxidation-reduction reactions without oxygen gas. To assist NASA incorporate this possibility in its efforts to search for life, the NRC was asked to carry out a study to evaluate whether nonstandard biochemistry might support life in solar system and conceivable extrasolar environments, and to define areas to guide research in this area. This book presents an exploration of a limited set of hypothetical chemistries of life, a review of current knowledge concerning key questions or hypotheses about nonterran life, and suggestions for future research.

From Nucleic Acid Sequences to Molecular Medicine-Volker A. Erdmann 2012-06-13 Despite a half century of structural, biophysical and biochemical investigations of ribonucleic acids, they are still mysterious. RNA stand at fertile frontiers where leading interdisciplinary research is carried out across fields from genomics, proteomics, dynamics as well as biochemistry and molecular biology. From 20 years it is clear, that genetic regulation of eukaryotic organisms has been misunderstood for the last years that the expression of genetic information is effected only by proteins. Basic understanding of nucleic acids has enhanced our foundation to probe novel biological functions. This is especially evident for RNA molecules whose functionality, maturation, and regulation require formation of correct secondary structure through encoded base-pairing interactions.

Artificial Nucleases-Maria A. Zenkova 2012-12-06 The development of agents capable of cleaving RNA and DNA has attracted considerable attention from researchers in the last few years, because of the immediate and very important applications they can find in the emerging fields of biotechnology and pharmacology. There are essentially two classes of these agents - nucleases that occur naturally inside cells and synthetically produced artificial nucleases. The first class includes protein enzyme nucleases and catalytic RNA structured ribozymes that perform cleavage of the phosphodiester bonds in nucleic acids according to a hydrolytic pathway in the course of different biochemical processes in the cell. A different pathway is used by some antibiotics which cleave DNA via redox-based mechanisms resulting in oxidative damage of nucleotide units and breakage of the DNA backbone. The above molecules are indispensable tools for manipulating nucleic acids and processing RNA. DNA-cleaving antibiotics and cytotoxic ribonucleases have demonstrated utility as chemotherapeutic agents. The second class, artificial nucleases, are rationally designed to imitate the active centers of natural enzymes by simple structures possessing minimal sets of the most important characteristics that are essential for catalysis. The above molecules are also used to create artificial RNA and DNA enzymes capable of cleaving RNA. Being less efficient and specific as compared to the natural enzymes, the primitive mimics are smaller and robust and can function in a broad range of conditions.

Molecular Beacons-Chaoyong James Yang 2013-08-15 Molecular Beacons explains working principle of molecular beacons, discusses their design, synthesis, purification and characterization, explores their thermodynamic and kinetic properties, and more importantly, reviews their in vivo and in vitro applications with the emphasis on the design and modification of molecular beacons for in vivo mRNA imaging applications. This book is designed to bring together in a single resource an organized and comprehensive view of molecular beacons and will be a valuable resource for academic, clinical and industrial scientists and graduate students who may consider exploring molecular beacons in their research or practice. Chaoyong James Yang is the Lu Jiaxi Professor of Chemistry at Xiamen University, China. Weihong Tan is a Distinguished Professor of Chemistry and Biomedical Engineering at Hunan University, China and also a University of Florida Distinguished Professor and V. T. and Louis Jackson Professor of Chemistry at the University of Florida, USA.

Polyunsaturated Fatty Acid Metabolism-Graham C. Burdge 2018-05-04 Polyunsaturated Fatty Acid Metabolism explores a number of major roles of PUFA in the body, including its role as a component of cell membranes and how it provides substrates for the synthesis of lipid second messengers. Recent studies are unraveling the effect of interactions between diet and endocrine factors and genetic and epigenetic variation on the regulation of PUFA biosynthesis in animals. Together, these recent findings provide novel insights into the impact of differences in PUFA supply on health. This book captures these findings in a manner that marks the state-of-the-art, placing them in the wider context of PUFA metabolism and nutritional science. Users will find a comprehensive discussion on the topic that presents the contributions of leading researchers who combine their knowledge to create a cohesive academic resource for researchers, those involved in production, and health policymakers. Provides a comprehensive view of polyunsaturated fatty acid metabolism Describes underlying metabolism on lipids that include polyunsaturated fatty acids Includes discussions on recent findings.
Antisense Strategies—Renato Baserga 1992 The antisense strategy has been used to study cellular proliferation and differentiation as well as to target chemotherapy against viral products such as HIV. It shows promise in the isolation of bone marrow stem cells and the purging of bone marrow. This volume, covering cellular proliferation, ribozymes-transcriptional regulation, cellular differentiation, and transgenic animals should be important to both basic and clinical scientists.

Aptamers for Analytical Applications—Yiyang Dong 2019-01-04 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 peptides, 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.

Cyclic Hydrocarbons—Advances in Research and Application: 2012 Edition—2012-12-26 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 information is available at http://www.ScholarlyEditions.com/.

Reductions by the Alumino- and Borohydrides in Organic Synthesis—J. Seyden-Penne 1997-09 A complete guide to selection and use of the best reagents for a wide range of transformations This book is the updated and expanded Second Edition of Jacqueline Seyden-Penne's practical guide to the selection of reducing reagents in organic synthesis. It is an indispensable working resource for organic synthetic chemists—the only reference focusing exclusively on aluminohydrides and borohydrides and their derivatives. Simple to use, it is organized according to specific reductions so that chemists can more easily match the best reagent to a given transformation. Throughout, Dr. Seyden-Penne emphasizes four crucial categories: compatibility, possibilities for partial reduction, the regio- and stereoselectivity of reductions that are altered or controlled by neighboring groups, and asymmetric reductions. Extremely well-referenced, Reductions by the Alumino- and Borohydrides in Organic Synthesis provides the most up-to-date, detailed, and practical guide for performing highly selective reductions * Chemo-, regio-, stereo-, and enantioselective reductions of both simple and complex compounds * Best methods for obtaining the main functional groups by hydride-reduction, provided in quick-reference tabular form * New and more selective reagents developed within the last five years * Experimental conditions, including solvent and temperature, and yields for most cases described.

Detection of Non-Amplified Genomic DNA—Giuseppe Spoto 2012-07-06 This book offers an overview of state-of-the-art in non amplified DNA detection methods and provides chemists, biochemists, biotechnologists and material scientists with an introduction to these methods. In fact all these fields have dedicated resources to the problem of nucleic acid detection, each contributing with their own specific methods and concepts. This book will explain the basic principles of the different non amplified DNA detection methods available, highlighting their respective advantages and limitations. Non-amplified DNA detection can be achieved by adopting different techniques. Such techniques have allowed the commercialization of innovative platforms for DNA detection that are expected to break into the DNA diagnostics market. The enhanced sensitivity required for the detection of non amplified genomic DNA has prompted new strategies that can achieve ultrasensitivity by combining specific materials with specific detection tools. Advanced materials play multiple roles in ultrasensitive detection. Optical and electrochemical detection tools are among the most widely investigated to analyze non amplified nucleic acids. Biosensors based on piezoelectric crystal have been also used to detect unamplified genomic DNA. The main scientific topics related to DNA diagnostics are discussed by an outstanding set of authors with proven experience in this field.

Organophosphorus Chemistry—David W. Allen 2008-02-04 A concise but comprehensive annual survey of a vast field of study enabling the reader to rapidly keep abreast of the latest developments in this specialist area.

Non-Natural Nucleic Acids—Nathanial Shank 2020-05-08 This volume provides relevant synthetic strategies, incorporation, and applications of non-natural nucleic acids. Chapters detail monomer synthesis, oligomer synthesis/construction, and applications allowing researchers to explore and determine which methodology or methodologies are relevant to their needs. Written in the highly successful Methods in Molecular Biology series format, 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 cutting-edge, Non-Natural Nucleic Acids: Methods and Protocols aims to serve as a guide for researchers exploring their own inquiries and to provide a springboard for new endeavors.

Dictionary of Carbohydrates—Stephen Hanessian 2008-02-04 A concise but comprehensive annual survey of a vast field of study enabling the reader to rapidly keep abreast of the latest developments in this specialist area.

Natural Products in Medicinal Chemistry—Stephen Hanessian 2013-12-18 The inspiration provided by biologically active natural products to conceive of hybrids, congeners, analogs and unnatural variants has been the inspiration of innovative platforms and tools. This book offers an overview of state-of-the-art in non amplified DNA detection methods and provides chemists, biochemists, biotechnologists and material scientists with an introduction to these methods. In fact all these fields have dedicated resources to the problem of nucleic acid detection, each contributing with their own specific methods and concepts. This book will explain the basic principles of the different non amplified DNA detection methods available, highlighting their respective advantages and limitations. Non-amplified DNA detection can be achieved by adopting different techniques. Such techniques have allowed the commercialization of innovative platforms for DNA detection that are expected to break into the DNA diagnostics market. The enhanced sensitivity required for the detection of non amplified genomic DNA has prompted new strategies that can achieve ultrasensitivity by combining specific materials with specific detection tools. Advanced materials play multiple roles in ultrasensitive detection. Optical and electrochemical detection tools are among the most widely investigated to analyze non amplified nucleic acids. Biosensors based on piezoelectric crystal have been also used to detect unamplified genomic DNA. The main scientific topics related to DNA diagnostics are discussed by an outstanding set of authors with proven experience in this field.

Science—John Michels (Journalist) 1959

Protocols for Oligonucleotides and Analogs—Sudhir Agrawal 1993-08-31 When first conceived, not only was the aim of Protocols for Oligo nucleotides and Analogs to provide wide coverage of the oligonucleotide chemistry of... The very first book on this topic was edited and published by Michael Gait in 1984, in whose laboratory I encountered the newer aspects of oligonucleotide chemistry. Since then, oligonucleotide research has developed to such an extent that its uses extend far beyond basic studies, and now find wide...
application throughout clinical science as well. Until recently, the major application of oligonucleotides has been in the area of DNA-based diagnostic and “antisense oligonucleotide-based therapeutic approaches. However, oligonucleotides are now also being used as therapeutic agents and are thus frequently found in clinical trials in humans. Synthesis of unmodified oligonucleotides using automated synthesizers has become a common practice in numerous laboratories. However, improvements on the existing techniques and the introduction of ever newer methods for oligonucleotide synthesis is constantly driving ahead in the leading research laboratories. And several new oligonucleotide analogs have been synthesized and studied for their individual properties in recent years. The present volume strives to bring the readers the most up-to-date information on the newest aspects of synthesis of oligo nucleotides and their analogs. A separate volume covers synthesis of oligonucleotide conjugates, along with most of the analytical techniques presently used for analysis of oligonucleotides.