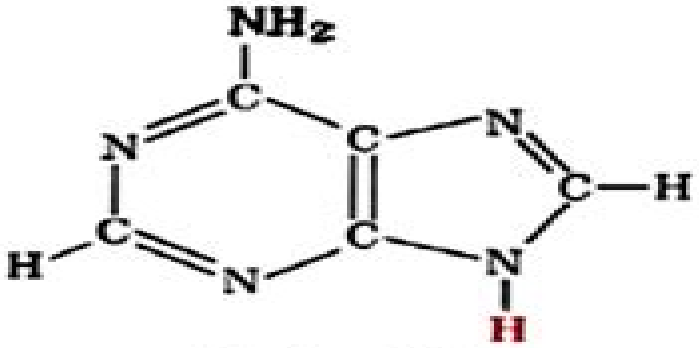
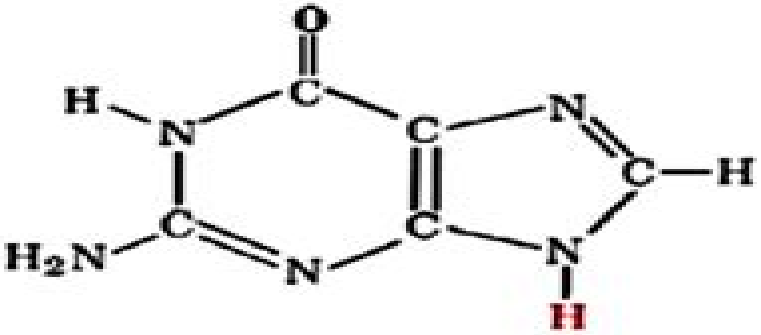
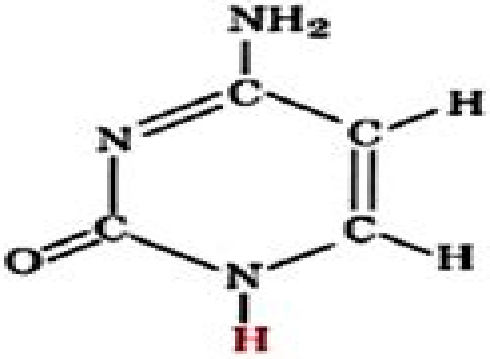


Adenine (A)
(DNA and RNA)

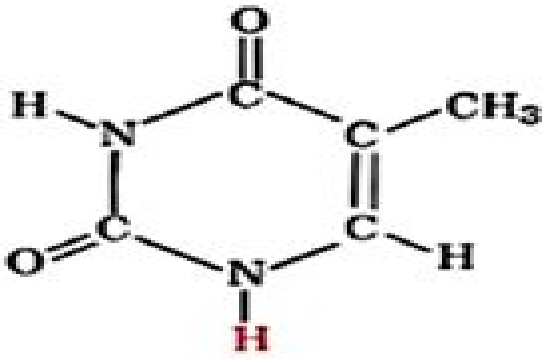


Guanine (G)
(DNA and RNA)

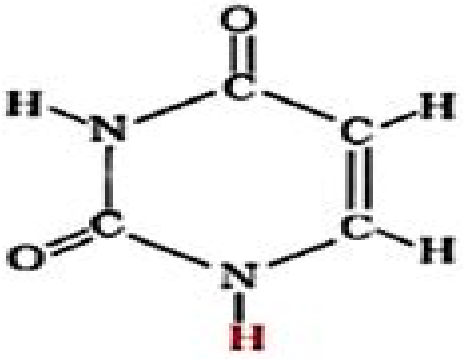
Purines



Cytosine (C)
(DNA and RNA)



Thymine (T)
(DNA only)



Uracil (U)
(RNA only)

Pyrimidines

Structures of Nucleic Acids

Principles Of Nucleic Acid Structure

Martin Egli,Wolfram Saenger

Principles Of Nucleic Acid Structure:

Principles of Nucleic Acid Structure Wolfram Saenger,2013-12-01 New textbooks at all levels of chemistry appear with great regularity Some fields like basic biochemistry organic reaction mechanisms and chemical ther modynamics are well represented by many excellent texts and new or revised editions are published sufficiently often to keep up with progress in research However some areas of chemistry especially many of those taught at the grad uate level suffer from a real lack of up to date textbooks The most serious needs occur in fields that are rapidly changing Textbooks in these subjects usually have to be written by scientists actually involved in the research which is advancing the field It is not often easy to persuade such individuals to set time aside to help spread the knowledge they have accumulated Our goal in this series is to pinpoint areas of chemistry where recent progress has outpaced what is covered in any available textbooks and then seek out and persuade experts in these fields to produce relatively concise but instructive introductions to their fields These should serve the needs of one semester or one quarter graduate courses in chemistry and biochemistry In some cases the availability of texts in active research areas should help stimulate the creation of new courses CHARLES R CANTOR New York Preface This monograph is based on a review on polynucleotide structures written for a book series in 1976 *Principles of Nucleic Acid Structure* Stephen Neidle,2010-07-26 This unique and practical resource provides the most complete and concise summary of underlying principles and approaches to studying nucleic acid structure including discussion of x ray crystallography NMR molecular modelling and databases Its focus is on a survey of structures especially important for biomedical research and pharmacological applications To aid novices Principles of Nucleic Acid Structure includes an introduction to technical lingo used to describe nucleic acid structure and conformations roll slide twist buckle etc This completely updated edition features expanded coverage of the latest advances relevant to recognition of DNA and RNA by small molecules and proteins In particular the reader will find extensive new discussions on RNA folding ribosome structure and antibiotic interactions DNA quadruplexes DNA and RNA protein complexes and short interfering RNA siRNA This handy guide ends with a complete list of resources including relevant online databases and software Completely updated with expanded discussion of topics such as RNA folding ribosome structure and antibiotic interactions DNA quadruplexes DNA and RNA protein complexes and short interfering RNA siRNA Includes a complete list of resources including relevant online databases and software Defines technical lingo for novices *Principles of Nucleic Acid Structure* Stephen Neidle,Mark Sanderson,2021-10-15 Principles of Nucleic Acid Structure Second Edition provides the most complete and concise summary of underlying principles and approaches to studying nucleic acid structure including discussions of X ray crystallography NMR molecular modelling and databases The book s focus is on a survey of structures that are especially important for biomedical research and pharmacological applications This updated edition includes the latest advances relevant to recognition of DNA and RNA by small molecules and proteins including sections on RNA folding ribosome structure and antibiotic interactions DNA

quadruplexes DNA and RNA protein complexes and short interfering RNA siRNA This reference is a must have for those seeking an authoritative comprehensive and up to date source on all aspects of nucleic acid structure from basic first principles to details of recent research results Completely updated with an expanded section on protein nucleic acid interactions that reflects major increases in our knowledge Defines technical terms for novices Includes a complete list of resources including relevant online databases and software as well as useful websites *Principles of Nucleic Acid Structure* H. Saedler,Wolfram Saenger,1983 *Basic Principles in Nucleic Acid Chemistry V2* Paul O.P. Ts'o,2012-12-02 Basic Principles in Nuclear Acid Chemistry Volume II presents the significant progress in nucleic acid research and its contribution and influence on various aspects of human life This book contains five chapters and begins with the susceptibility of nucleic acids towards attack by chemical reagents whose reactions with polynucleotides have been studied This topic is followed by a presentation of experimental techniques used to study the properties of nucleic acids The following chapter discusses some basic features embodied in the polyribo and poly deoxyribonucleotide backbone chains the possibility of rotation around backbone bonds in the random single stranded form and the short and long range interactions in idealized and real chains This chapter also looks into the thermodynamic and polyelectrolyte aspects of nucleic acid behavior A chapter describes the special features of the third class of DNA namely closed duplex DNA in which covalent chain scissions are absent The last chapter examines the intrinsic properties and the interaction of the dimers and oligomers with special emphasis on the influence of the phosphodiester linkages on the conformation and interaction of these short segments of nucleic acids This book is of great value to workers in biomedical research and to higher level biochemistry instructors

Basic Principles in Nucleic Acid Chemistry V1 Paul O.P. Ts'o,2012-12-02 Basic Principles in Nucleic Acid Chemistry Volume I provides information pertinent to the fundamental aspects of nucleic acids This book discusses the development of the basic principles in nucleic acid research that will serve as a foundation for further advancement in nucleic acid research Organized into six chapters this volume begins with an overview of the history of the scientific study of nucleic acid as a genetic material This text then examines the utility of the analogs of the naturally occurring nucleic acid components as biochemical tools and as therapeutic agents Other chapters consider mass spectrometry that deals with the production and chemistry of ions in the vapor phase This book discusses as well the various aspects of the excited states of the nucleic acids The final chapter deals with the systematic study of the physiochemical properties of the monomeric units of nucleic acid This book is a valuable resource for molecular biologists scientists and research workers **Nucleic Acid Structure and Recognition** Stephen Neidle,2002 This book provides a detailed view of the molecular structures of DNA and RNA and how they are recognised by small molecules and proteins Extensive source material is provided including information on relevant web sites and computer programmes The major methods of structural investigation for nucleic acids X ray crystallography NMR and molecular modelling are reviewed and their scope and limitations in the context of nucleic acids discussed Also

covered are the conformational features of nucleic acid building blocks including a description of how base pair morphologies are analysed the structures of DNA double helices and helical oligonucleotides emphasising current ideas on sequence dependent structure and DNA DNA interactions including triplexes and quadruplexes The principles of RNA folding ribosome and ribozyme structure are also surveyed Both covalent and non covalent nucleic acid interactions with small molecules are described with the emphasis on recognition principles and sequence specific gene recognition The principles of protein nucleic acid are covered focussing on regulatory proteins Nucleic Acid Structure and Recognition will therefore equip readers with a good understanding of all the important aspects of this major field The Nucleic Acid Database NDB crystallographic and NMR structures for the nucleic acid structures described in the book are freely available through the Nucleic Acid Structure and Recognition website *Topics in Nucleic Acid Structure* Stephen Neidle,1981-06-18

Principles of Nucleic Acid Structure Martin Egli,Wolfram Saenger,2011-10-14 New textbooks at all levels of chemistry appear with great regularity Some fields like basic biochemistry organic reaction mechanisms and chemical ther modynamics are well represented by many excellent texts and new or revised editions are published sufficiently often to keep up with progress in research However some areas of chemistry especially many of those taught at the grad uate level suffer from a real lack of up to date textbooks The most serious needs occur in fields that are rapidly changing Textbooks in these subjects usually have to be written by scientists actually involved in the research which is advancing the field It is not often easy to persuade such individuals to set time aside to help spread the knowledge they have accumulated Our goal in this series is to pinpoint areas of chemistry where recent progress has outpaced what is covered in any available textbooks and then seek out and persuade experts in these fields to produce relatively concise but instructive introductions to their fields These should serve the needs of one semester or one quarter graduate courses in chemistry and biochemistry In some cases the availability of texts in active research areas should help stimulate the creation of new courses CHARLES R CANTOR New York Preface This monograph is based on a review on polynucleotide structures written for a book series in 1976 **Nucleic Acid Design** Fouad Sabry,2025-03-14 Unlock the potential of nucleic acid design in the rapidly evolving field of DNA nanotechnology This book is an essential resource for professionals researchers students and enthusiasts eager to explore how nucleic acids can be engineered for groundbreaking applications Delve into the principles and techniques shaping molecular structures and driving innovation in nanotechnology and synthetic biology Chapters Brief Overview 1 Nucleic acid design Learn how tailored sequences drive structural formation and nanotechnological functions 2 Denaturation biochemistry Explore the thermal and chemical factors influencing nucleic acid stability 3 Nucleic acid structure prediction Discover computational tools predicting secondary and tertiary formations 4 Triplestranded DNA Understand the mechanics and applications of threestranded nucleic acid structures 5 Base pair Examine the fundamental interactions forming the genetic code and structural frameworks 6 DNA nanotechnology Investigate how DNA is manipulated to create selfassembling

nanostructures 7 Helicase Study the molecular motors unwinding DNA for replication and repair processes 8 ViennaRNA Package Utilize computational software for RNA secondary structure predictions and analysis 9 Nucleic acid tertiary structure Analyze the higherorder folding principles essential for function 10 Nucleic acid thermodynamics Understand the energetic principles governing nucleic acid stability 11 RNA origami Explore the art of folding RNA into intricate functional nanostructures 12 Spherical nucleic acid Investigate nanoscale spherical architectures with biomedical applications 13 Holliday junction Delve into the structural dynamics of recombination intermediates 14 Hoogsteen base pair Examine alternative hydrogen bonding patterns and their biological significance 15 Nucleic acid secondary structure Learn how sequence dictates hairpins loops and other formations 16 Nucleic acid double helix Revisit the canonical structure that underpins genetic information 17 Nucleic acid structure Analyze the interplay of primary secondary and tertiary formations 18 Peptide nucleic acid Discover synthetic nucleic acid analogs with unique stability and binding properties 19 Noncanonical base pairing Investigate unconventional interactions that expand structural complexity 20 DNA origami Learn how DNA strands are folded into programmable nanostructures 21 TectoRNA Examine modular RNA structures enabling complex selfassembly and function Mastering nucleic acid design opens doors to innovations in medicine nanotechnology and synthetic biology This book provides a structured indepth guide tailored to learners and experts alike offering knowledge that far outweighs its cost Expand your expertise and explore the limitless potential of DNA nanotechnology today

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