

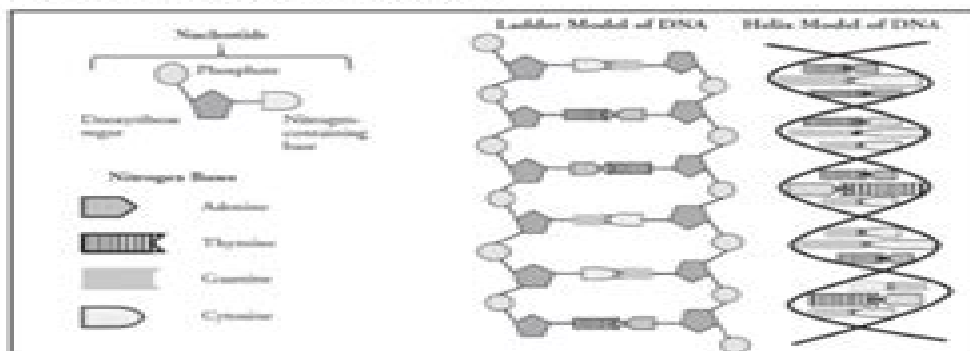
POGIL – DNA Structure and Replication

How is genetic information stored and copied?

Why?

Deoxyribonucleic acid or **DNA** is the molecule of heredity. It contains the genetic blueprint for life. For organisms to grow and repair damaged cells, each cell must be capable of accurately copying itself. So how does the structure of DNA allow it to copy itself so accurately?

Model 1 – The Structure of DNA



1. Refer to the diagram in Model 1.

- What are the three parts of a nucleotide?
- What kind of sugar is found in a nucleotide?
- Which nucleotide component contains nitrogen?
- Name the four nitrogen bases shown in Model 1.

2. DNA is often drawn in a "ladder model." Locate this drawing in Model 1.

- Circle a single nucleotide on each side of the ladder model of DNA.

- What part(s) of the nucleotides make up the rungs of the "ladder"?
- What parts of the nucleotides make up the sides (backbone) of the "ladder"?
- Look at the bottom and top of the "ladder" in Model 1. Are the rungs parallel (the ends of the strands match) or antiparallel (the ends of the strands are opposites)? Describe what antiparallel means.
- Label the 5' and 3' end of each strand in the ladder model of DNA in Model 1.

3. The two strands of DNA are held together with hydrogen bonds between the nitrogen bases. These are weak bonds between polar molecules. Which bases are paired together with hydrogen bonds? How many hydrogen bonds connect the bases of each pair? Draw and label a diagram showing each base pairing.

READ: Erwin Chargaff (1906–2002), an Austrian-American biochemist, investigated the ratio of nucleotide bases found in the DNA from a variety of organisms. From his research, as well as research by Rosalind Franklin and Maurice Wilkins, Watson and Crick developed the complementary base-pair rule during their race to discover the structure of DNA. The complementary base-pair rule states that adenine and thymine form pairs across two strands, and guanine and cytosine form pairs across two strands.

4. Fill in the complementary bases on the strand below according to the base-pair rule.

5' - A T C C A G C G G T C A A - 3'

5. The proportions of the bases are consistent within a species; however, they do vary between species. Using the base-pair rules, complete the following table to show the percentage of each type of base in the three different organisms.

Organism	Percentage of each type of base			
	Adenine	Guanine	Cytosine	Thymine
Human		31		19
Cow	28		22	
Salmon	21			

Pogil Dna Structure And Replication Packet Answers

JG Myers



Pogil Dna Structure And Replication Packet Answers:

DNA Structure and Replication, 19?? *DNA Structure and Replication* Khalid Majid Fazili, Syed Tanveer, 2012-01 The field of Molecular Biology continues to attract and excite the students of all branches of life sciences including biology and Medicine The text covers two basic but very important aspects of Molecular Biology DNA structure and replication Some of the aspects of DNA structure which the beginners usually find difficult to follow and understand from the usual texts have been discussed and simplified DNA replication in prokaryotic organisms has been explained Eukaryotic DNA and its replication has also been covered The text though appears comprehensive is basically meant for the beginners **DNA Structure Replication Mutation** Roland Rodriguez, Gene Organisation, Replication and Repair Mr. Rohit Manglik, 2024-06-24 Covers DNA structure replication and repair mechanisms focusing on molecular processes and their implications in genetic stability and disease **DNA Replication** Sonya Vengrova, Jacob Z. Dalgaard, 2016-08-23 Since the discovery of DNA structure and throughout the ensuing DNA era the field of DNA replication has expanded to cover a vast number of experimental systems In *DNA Replication Methods and Protocols* expert researchers present a collection of techniques and approaches used to investigate DNA replication with an emphasis on the most recent technological developments Beginning with several informative introductory review chapters this extensive volume is organized for clarity while fully encouraging innovation by the mixing of methods to create new techniques Written in the highly successful *Methods in Molecular Biology*™ series format chapters contain brief introductions to the topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and notes on troubleshooting and avoiding known pitfalls Comprehensive and cutting edge *DNA Replication Methods and Protocols* provides an excellent tool for both established laboratories and individuals new to this exciting field of research **DNA Structure and Function** The Open The Open Courses Library, 2019-11-07 DNA Structure and Function Biology The three letters DNA have now become synonymous with crime solving and genetic testing DNA can be retrieved from hair blood or saliva Each person's DNA is unique and it is possible to detect differences between individuals within a species on the basis of these unique features DNA analysis has many practical applications beyond forensics In humans DNA testing is applied to numerous uses determining paternity tracing genealogy identifying pathogens archeological research tracing disease outbreaks and studying human migration patterns In the medical field DNA is used in diagnostics new vaccine development and cancer therapy It is now possible to determine predisposition to diseases by looking at genes Chapter Outline Historical Basis of Modern Understanding DNA Structure and Sequencing Basics of DNA Replication DNA Replication in Prokaryotes DNA Replication in Eukaryotes DNA Repair The Open Courses Library introduces you to the best Open Source Courses *Exploring DNA Structure* Sandra Porter (Ph. D.), 2005 DNA Replication Judith L. Campbell, 1995-10-11 The critically acclaimed laboratory standard for forty years *Methods in Enzymology* is one of the most highly respected publications in the field of biochemistry

Since 1955 each volume has been eagerly awaited frequently consulted and praised by researchers and reviewers alike More than 250 volumes have been published all of them still in print and much of the material is relevant even today truly an essential publication for researchers in all fields of life sciences Key Features Includes descriptions of functional structural kinetic and genetic methods for analyzing major enzymes of DNA replication Describes strategies for studying interactions of these proteins during replication Provides comprehensive descriptions of uses of prokaryotic and eukaryotic crude in vitro replication systems and reconstitution of such systems from purified proteins Includes methods for analyzing DNA replication in vivo The Mystery of DNA Replication Karl G. Lark,1980 **DNA Structure Puzzles** Clive Delmonte,2000 DNA

Topology and the Problem of Separation of the Daughter Strands James Richard Potter,1984 Genome Duplication Melvin DePamphilis,Stephen Bell,2010-10-06 Genome Duplication provides a comprehensive and readable overview of the underlying principles that govern genome duplication in all forms of life from the simplest cell to the most complex multicellular organism Using examples from the three domains of life bacteria archaea and eukarya Genome Duplication shows how all living organisms store their genome as DNA and how they all use the same evolutionary conserved mechanism to duplicate it semi conservative DNA replication by the replication fork The text shows how the replication fork determines where organisms begin genome duplication how they produce a complete copy of their genome each time a cell divides and how they link genome duplication to cell division Genome Duplication explains how mistakes in genome duplication are associated with genetic disorders and cancer and how understanding genome duplication its regulation and how the mechanisms differ between different forms of life is critical to the understanding and treatment of human disease DNA and RNA Linley Erin Hall,2010-08-15 Introduces DNA and RNA discussing how heredity works what can happen when the code goes wrong replication and new advances in science and technology DNA Structure: Alphabet Soup for the Cellular Soul P. Shing Ho,Megan Carter,2011 DNA Synthesis and Its Regulation Mehran Goulian,Philip C. Hanawalt,1975

DNA Code Basics Zara Sagan,AI,2025-02-13 DNA Code Basics explores the central dogma of molecular biology illuminating how DNA stores and transmits genetic information The book unravels the complexities of DNA structure genetic coding and the critical processes of replication and transcription Understanding these mechanisms is fundamental as they underpin not only basic life functions but also our comprehension of genetic diseases and advancements in biotechnology The book presents a structured journey starting with the historical context of DNA s discovery and progressing through its molecular composition It then delves into DNA replication ensuring genetic information is passed accurately through generations The intricacies of the genetic code are explained illustrating how nucleotide sequences translate into amino acids and complex proteins essential for all life functions Finally the book details transcription where genetic code is converted into RNA for protein synthesis What makes this book unique is its ability to present complex molecular processes in an accessible manner using clear diagrams and examples to foster a deeper understanding of molecular biology

Aspects of DNA Structure and Reactivity Jacqueline Drak,1991 Conference on DNA Structure and Interactions
Akademie věd České republiky,2000 *DNA Structure* Christopher Reuben Calladine,H. R. Drew,University of Cambridge.
Engineering Department,1995 **Double Helix** Danielle Smith-Llera,2017-07-01 To the untrained eye Photo 51 was simply
a grainy black and white image of dark marks scattered in a rough cross shape But to the eye of a trained scientist it was a
clear portrait of a DNA fiber taken with X rays And to young scientists James Watson and Francis Crick it confirmed their
guess of deoxyribonucleic acid s structure In 1953 the pair was racing toward solving the mystery of DNA s structure before
other scientists could beat them to it They and others believed that finding the simple structure of the DNA molecule would
answer a great mystery how do organisms live grow develop and survive generation after generation Photo 51 and
subsequent models based on the photo would prove to be the key to unlocking the secret of life Publisher s website

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