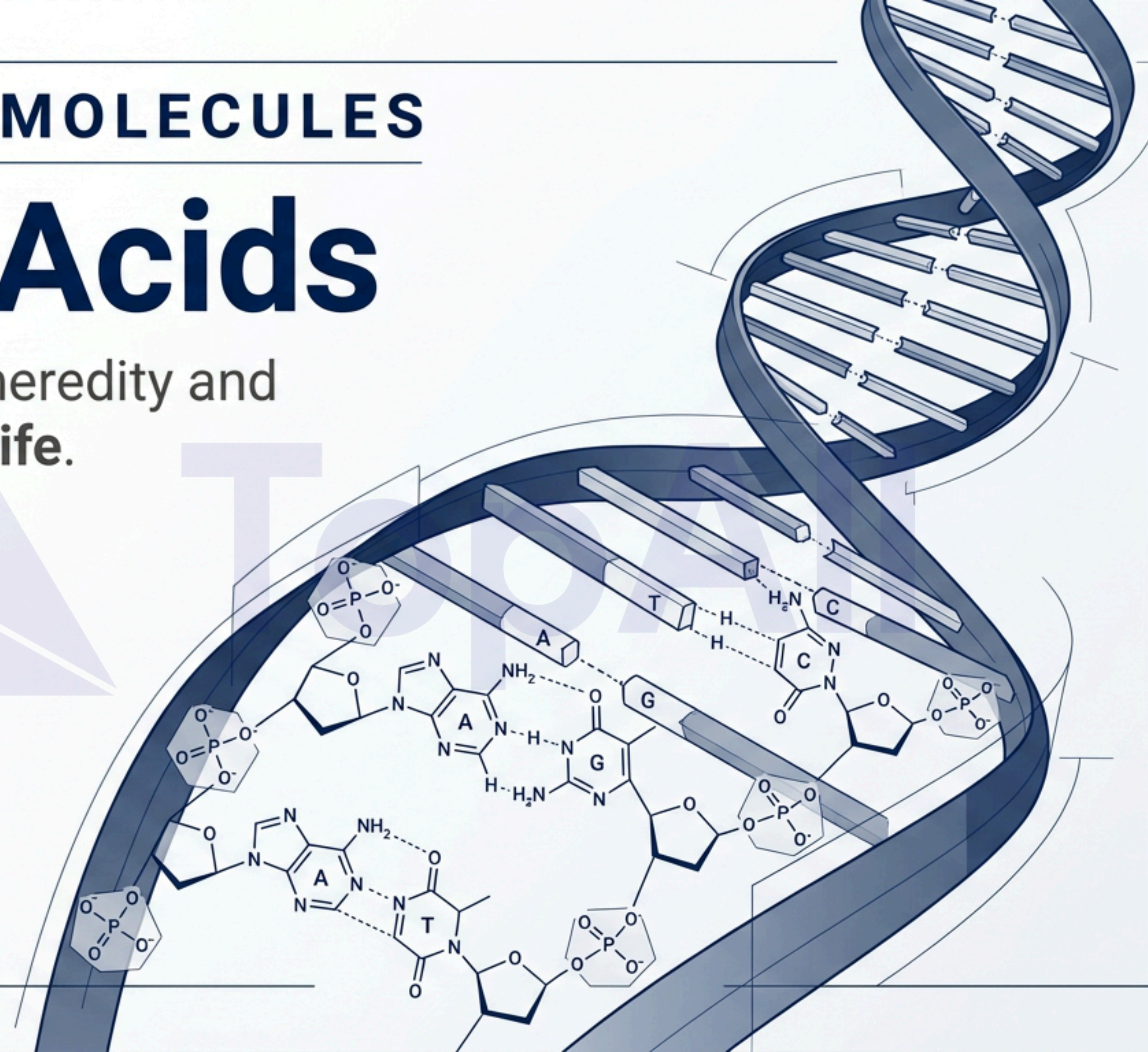


UNIT 10.5 • BIOMOLECULES

Nucleic Acids

The chemical basis of heredity and the **molecular logic of life.**



MACRO-TO-MICRO ZOOM

Nucleic Acids and Heredity



Heredity

The transmission of inherent characteristics from one generation to the next.

Chromosomes

The specific particles in the cell nucleus directly responsible for heredity.

$$[\text{Chromosomes}] = [\text{Proteins}] + [\text{Nucleic Acids}]$$

Nucleic acids are the ultimate reserve of genetic information, responsible for maintaining the exact identity of different species over millions of years.



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

Practice Now



At prep.topall.app

Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



DNA and RNA Overview

Deoxyribonucleic Acid (DNA)		Ribonucleic Acid (RNA)	
Sugar	β -D-2-deoxyribose	Sugar	β -D-ribose
Bases	Adenine (A), Guanine (G), Cytosine (C), Thymine (T)	Bases	Adenine (A), Guanine (G), Cytosine (C), Uracil (U)
Structure	Double-strand helix (Watson & Crick model)	Structure	Single strand (can fold back on itself)
Function	Self-duplication, chemical basis of heredity, and DNA fingerprinting (forensics, paternity).	Function	Protein synthesis via specialized molecules (mRNA, rRNA, tRNA).

Despite these differences, both are long-chain polymers of nucleotides, known collectively as polynucleotides.

Nucleic Acids as Polynucleotides

Formula Card

Step 1:

Base
(at 1' position) + Pentose Sugar = **Nucleoside**

Step 2:

Nucleoside + Phosphoric Acid
(at 5' position) = **Nucleotide**

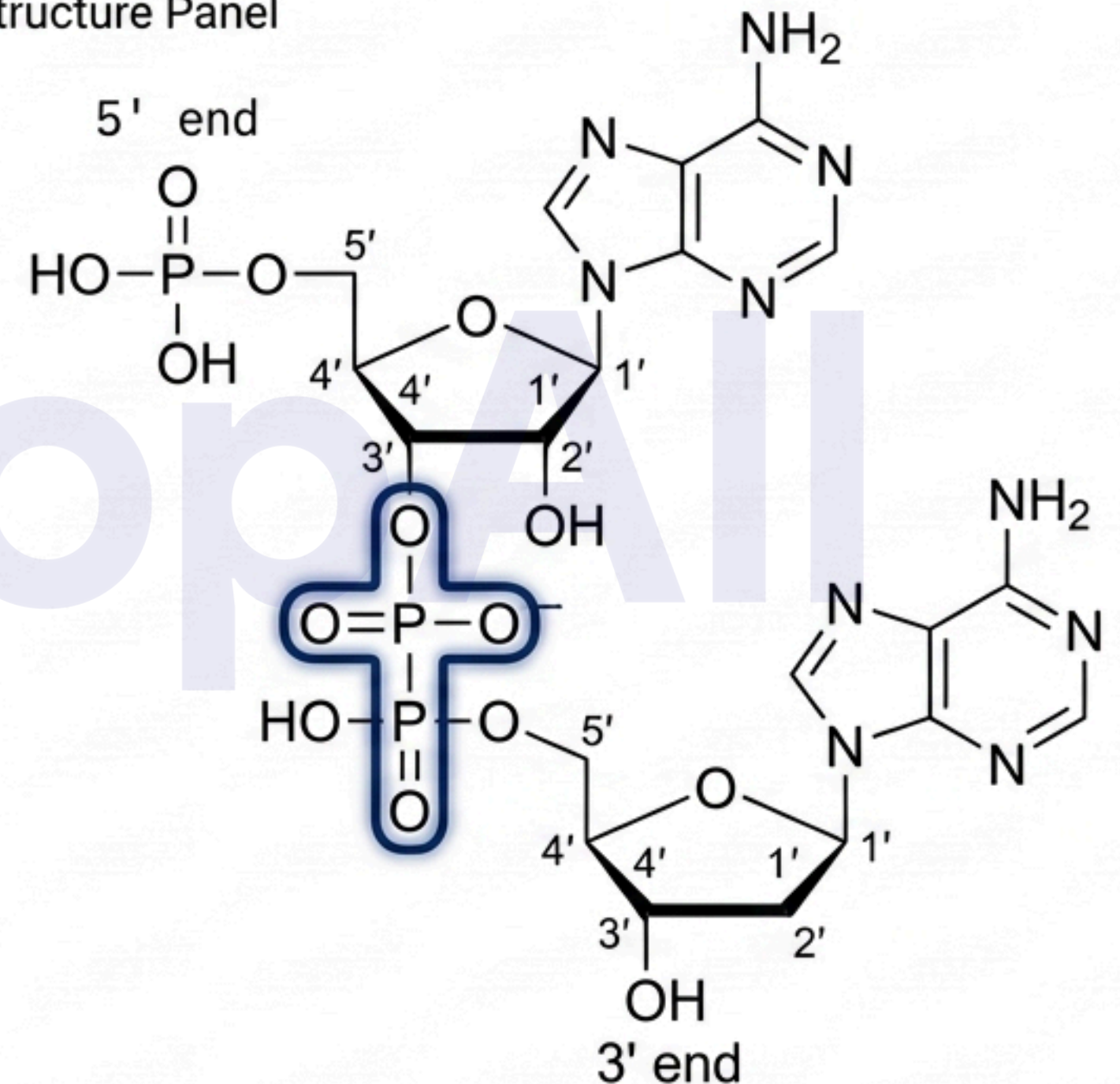
Step 3:

Nucleotide + **Nucleotide** + ... = **Polynucleotide**

Key-Takeaway Badge

Primary Structure: The exact sequence of nucleotides in the polymer chain.

Structure Panel



Chemistry as Biological Information

Concept 1: The Code

The specific sequence of bases acts as a biological alphabet. A DNA molecule contains the exact message required for the synthesis of a particular protein.

Concept 2: The Mechanism

Secondary Structure: The two strands of a DNA helix are complementary, not identical. They are held together by highly specific hydrogen bonds.



(Adenine specifically pairs with Thymine)
(Cytosine specifically pairs with Guanine)

This complementary pairing allows for identical replication during cell division.

The harmonious synchrony of non-living atoms—sugar, phosphate, and nitrogenous bases—creates the molecular logic of a living system.



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

That's exactly what TopAll Pro is built for.

Try TopAll Pro Now

What TopAll Pro Does Differently

-  **Stuck? Snap it. Solve it. — Doubts AI**
Photo → step-by-step solution in seconds, 24/7
-  **Your AI Coach finds your blind spots**
Concept-level weakness detection — not just chapter-level
-  **4.5 Lakh+ questions. Never run out.**
13× more content than any other prep app in India
-  **Build your own test in 60 seconds**
Pick a chapter, set difficulty — AI does the rest instantly.
-  **AI Recommendation that helps you improve**
AI Recommendation Analysis your Tests and tell you where you need to improve.



Practice the moment you finish studying
Jump in while the concept is still fresh in your head

4.5L+
MCQs

1.5L+
Students

AI Powered
In-Depth Analysis