"FirstHope Pharmacy" YouTube for Video | Instagram@__firsthope__ | Download Firsthope App

DNA and RNA

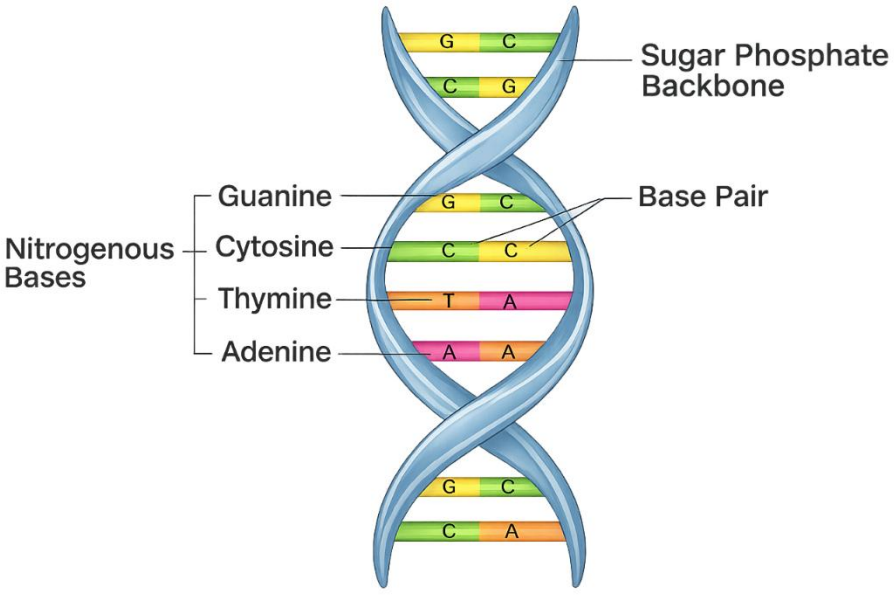
DNA and the Flow of Molecular Information

What is DNA?

- DNA stands for **Deoxyribonucleic Acid**.
- It is a long molecule found inside the **nucleus** of the cell.
- DNA contains the instructions that allow an organism to:
  - develop,
  - survive,
  - reproduce.

Structure of DNA

- DNA is made of smaller units called **nucleotides**.
- **Each nucleotide has:**
  - a sugar (deoxyribose),
  - a phosphate group,
  - a nitrogenous base:
    - A (adenine),
    - T (thymine),
    - C (cytosine),
    - G (guanine).



- The **sequence of bases** forms the genetic code.
- This code acts like an instruction manual for the cell.

The Genetic Code

- The order of the four bases (A, T, C and G) stores information.
- This information tells the cell how to make proteins.
- Proteins carry out most functions in the cell.

Central Dogma of Molecular Biology

DNA → RNA → Protein

Three main steps:

1. **Replication** – DNA makes a copy of itself.
2. **Transcription** – DNA is used to make RNA.
3. **Translation** – RNA is used to make a protein.

How the Information Flows in the Cell

- DNA remains inside the **nucleus**.
- A specific section of DNA called a **gene** is transcribed into **messenger RNA (mRNA)**.
- The mRNA leaves the nucleus and travels to a structure called a **ribosome**.
- The ribosome reads the mRNA and **links amino acids in the correct order**.
- This process produces a **protein**.

Why is the DNA → RNA → Protein Flow Important?

- Proteins perform most of the important jobs in a cell.
- **They act as:**
  - enzymes,
  - structural components,
  - messengers, and
  - transporters.
- Therefore, the flow of information from DNA to RNA to protein is **essential for the structure, function, and survival of all living cells**.

DNA Functioning

1. Replication – Copying the DNA

- Before a cell divides, it must make a copy of its DNA so that both new cells get the same instructions.
- **Where it happens:** In the nucleus (in eukaryotes).

First Hope

FREE PREVIEW

Click here to visit our website

PHARMACY PREMIUM NOTES

Complete subject and semesters are available on FirstHope app only.

Scan or click here

Click here to get the app >

Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram >

Scan or click here

@FirstHopeNotes

Instagram

@firsthope.official

Click here to follow >

YouTube channel

FirstHope-Pharmacy / Live streams

Click here to watch >

WhatsApp channel

Follow FirstHope on WhatsApp

Click here to join >

FirstHope website

firsthope.co.in

Click here to visit >

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.