Structure of RNA

DR. UTTAM KUMAR KANP
ASSISTANT PROFESSOR
DEPARTMENT OF BOTANY
NARAJOLE RAJ COLLEGE

CONTENTS

1. Discovery of RNA
2. What is RNA
3. Structure of RNA
4. Types of RNA

Discovery of RNA

- Swiss biochemist Friedrich Miescher (1844–1895) in 1869 separated the nucleus from the other parts of the cell and isolated phosphorus–containing nucleic acid.
- It was later found that there were two kinds of nucleic acids
  - One type of nucleic acid was obtained from **animal glands** and later called DNA
  - the other type, obtained from yeast cells, was called RNA.

Discovery of RNA

- In the 1940s biochemists realized that both DNA and RNA are present in all living cells.
- DNA is present only in the nucleus of the cell, RNA is found in both the nucleus as well as the cytoplasm.
- American chemist Marshall Nirenberg (1927–) was later credited with translating the code of life and was awarded the Nobel Prize in 1968.
  - He demonstrated that RNA could be translated into protein.

What is RNA?

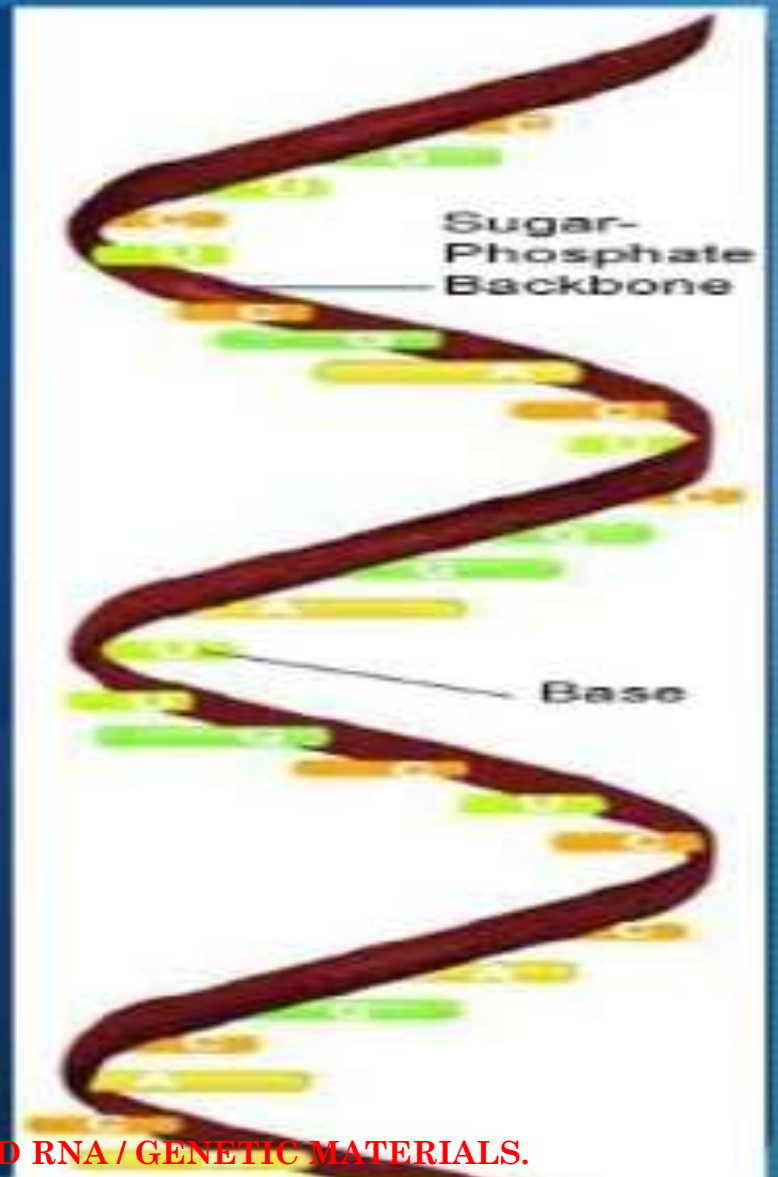
- RNA-stands for ribonucleic acid
  - is a polymeric molecule made up of one or more nucleotides.
  - A strand of RNA can be thought of as a chain with a nucleotide at each chain link.
  - Each nucleotide is made up of a base (adenine, cytosine, guanine, and uracil, typically abbreviated as A, C, G and U), a ribose sugar, and a phosphate.
- DNA and RNA form the fundamental building blocks of the universal genetic code.
- They can form complex structures which interact with proteins, other nucleic acids, and even small regulatory molecules.
- RNA can even play a role as an enzyme (so-called ribozymes) which can directly catalyse chemical reactions and regulate genetic expression.

Structure of RNA

- **Ribonucleic acid** (**RNA**) is a biologically important type of molecule that consists of a long chain of nucleotide units. Each nucleotide consists of a nitrogenous base, a ribose sugar, and a phosphate.
  - SUGAR
    - Ribose
  - Phosphate group
  - Nitrogen containing base
    - Adenine
    - Guanine
    - Cytosine
    - Uracil

Structure of RNA

- The structure of RNA nucleotides is very similar to that of DNA nucleotides
- DNA and RNA play very different roles from one another in modern cells.



Types of RNA

- Messenger RNA (mRNA) carries information from DNA to the ribosome
- Transfer RNA (tRNA) involved in the process of translation
- Ribosomal RNA (rRNA)

THANK YOU