

Lab No.#9#.

Bacterial Nucleic Acids

Major Molecules;

DNA, RNA and protein.

Prokaryotic DNA (DNA):

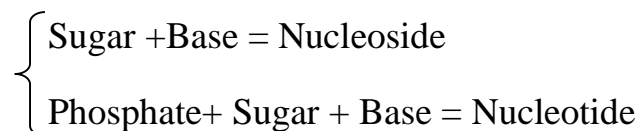
- DNA stands for Deoxyribonucleic acid.
- Bacterial DNA is circular and single chromosome.

(Contains all the genetic information used for development and functioning)

DNA is a set of blueprints needed to construct other components of cells, such as proteins and RNA molecules.

DNA Structure:

- Two long strands make the shape of a double helix.
- Both strands run in opposite directions to each other.
- Therefore anti-parallel.
- Strands made up of nucleotides.
- The backbones made of base, sugars and phosphate groups.



Structure of DNA

- Attached to each Deoxy ribose are of four nitrogen bases.
- **Purines**-Adenine, Guanine.
- **Pyrimidines**; Thymine and Cytosine.

Bases Pairing

PAIRING:

A = T A = U G = C

- GC content stabilizes the helix due to presence of three hydrogen bonds.

Biological function

- DNA---Chromosomes---Genes
- Genes –small sequences of DNA
- Carries all information for –development and function
- Their information is used to make protein with the help of RNA through - Transcription...Translation.
- The DNA double helix is stabilized by hydrogen bonds between the bases attached to the two strands.
- One major difference between DNA and RNA is the sugar, with the 2-deoxyribose in DNA being replaced by the alternative pentose sugar ribose in RNA.

RNA;

- RNA is Ribonucleic acid.
- Consists of a long chain of nucleotide units.
- Each nucleotide consists of a nitrogenous base, a ribose sugar, and a phosphate.
- RNA contains-Sugar Ribose instead of Deoxyribose
- Uracil is present instead of Thymine.

RNA

- Single stranded.
- Four bases.
- Adenine.
- Guanine.
- Cytosine.
- Uracil.
- A-U / G-C.

RNA –Function

1. Controls gene expression.
2. DNA is transcribed to RNA.
3. Plays an important role in protein synthesis.

Types of RNA;

1. Messenger RNA mRNA.
2. Ribosomal RNA rRNA .
3. Transfer RNA tRNA.

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Type	Abbr.	Function	Distribution
Messenger RNA	mRNA	Codes for protein	All organisms
Transfer RNA	t RNA	Translation and is the key to deciphering the code words in mRNA	All organisms
Ribosomal RNA	r RNA	Translation and associates with a set of proteins to form ribosomes	All organisms

Difference between RNA & DNA

RNA	DNA
contain ribose sugar	contains deoxy ribose
Has the base uracil	Has the base thymine
RNA is usually single-stranded	DNA is usually double-stranded

