



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

Coimbatore – 35



DEPARTMENT OF BIOMEDICAL ENGINEERING

Nucleosides are structural components closely related to nucleotides but lack the phosphate group. Here are some important notes about nucleosides:

1. Definition:

Nucleosides are organic molecules composed of a nitrogenous base and a pentose sugar. Unlike nucleotides, nucleosides do not contain a phosphate group.

2. Components of Nucleosides:

Nitrogenous Base: Similar to nucleotides, nucleosides contain a nitrogenous base, which can be a purine (adenine or guanine) or a pyrimidine (cytosine, thymine in DNA, or uracil in RNA).

Pentose Sugar: The pentose sugar in nucleosides is either deoxyribose (in DNA) or ribose (in RNA).

3. Formation of Nucleosides:

Nucleosides are formed when a nitrogenous base is covalently linked to the C-1 carbon of the pentose sugar through a glycosidic bond.

The glycosidic bond is formed by a condensation reaction, resulting in the loss of a water molecule.

4. Distinction from Nucleotides:

Unlike nucleotides, nucleosides do not contain phosphate groups.

Nucleosides are often considered the "building blocks" of nucleotides, as nucleotides are formed by adding phosphate groups to nucleosides.

5. Common Nucleosides:

Adenosine: Composed of adenine and ribose. It is a component of RNA.

Deoxyadenosine: Composed of adenine and deoxyribose. It is a component of DNA.

Cytidine: Composed of cytosine and ribose. It is a component of RNA.

Thymidine: Composed of thymine and deoxyribose. It is a component of DNA.

Uridine: Composed of uracil and ribose. It is a component of RNA.

6. Role in Nucleotide Synthesis:

Nucleosides serve as intermediates in the synthesis of nucleotides.

The addition of phosphate groups to nucleosides results in the formation of nucleotides.

Significance in Antiviral Drugs:



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Some antiviral drugs act as nucleoside analogs, mimicking natural nucleosides.

These analogs can interfere with viral replication by being incorporated into the viral DNA or RNA, disrupting the synthesis process.

7. Pharmacological Applications:

Nucleoside analogs are also used in cancer chemotherapy, as they can inhibit the replication of rapidly dividing cells.