



General biology 2

2nd stage

Lecture 3

DNA

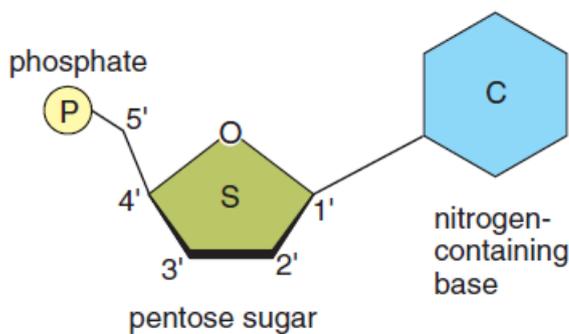
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DNA

The two types of nucleic acids are **DNA (deoxyribonucleic acid)** and **RNA (ribonucleic acid)**. Both DNA and RNA are polymers of nucleotides. Every **nucleotide** is a molecular complex of three types of subunit molecules—phosphate (phosphoric acid), a pentose sugar, and a nitrogen-containing base:



Genes: are pieces of deoxyribonucleic acid (DNA) that contain a code for a specific protein that works in one or more cell types in the body.

STRUCTURE OF NUCLEIC ACID (DNA AND RNA)

- 1– The nucleotides in DNA contain the sugar deoxyribose, and the nucleotides in RNA contain the sugar ribose.
- 2– There are four different types of bases in DNA: A _ **adenine**, T _ **thymine**, G _ **guanine**, and C _ **cytosine**. The base can have two rings (adenine or guanine) or one ring (thymine or cytosine).
- 3–In RNA, the base **uracil** replaces the base thymine.

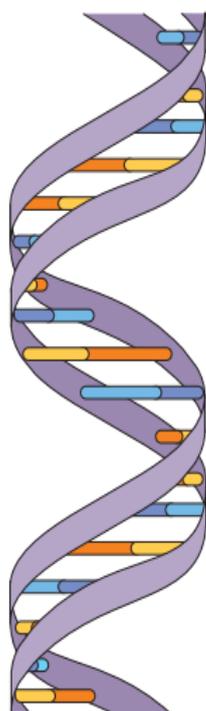
4- The nucleotides form a linear molecule called a strand, which has a backbone made up of phosphate–sugar phosphate– sugar, with the bases projecting to one side of the backbone.

5- DNA is double stranded, with the two strands twisted about each other in the form of a double helix. the two strands are held together by hydrogen bonds between the bases.

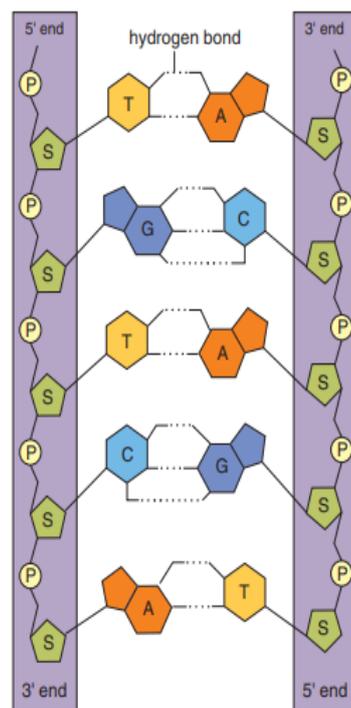
6- Thymine (T) always pairs with adenine (A), and guanine(G) always pairs with cytosine (C). Complementary bases have shapes that fit together.

7- The bases are purines with a double ring including (Adenine & Guanine) and pyrimidines with a single ring including (Thymine & Cytosine).

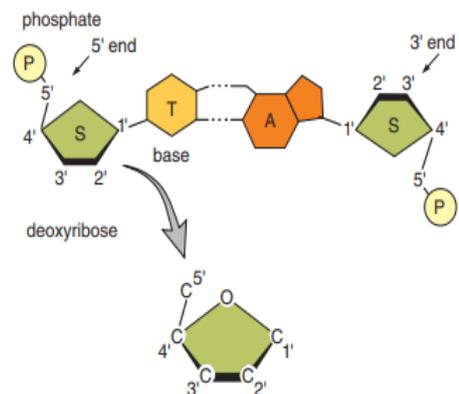
8- Complementary base pairing allows DNA to replicate in a way that ensures the sequence of bases will remain the same.



a. Double helix



b. Ladder structure



c. One pair of bases

ATP (Adenosine Triphosphate)

1– When adenosine (adenine plus ribose) is modified by the addition of three phosphate groups instead of one, it becomes **ATP (adenosine triphosphate)**, an energy carrier in cells.

2– the energy of glucose is converted to that of ATP molecules. ATP contains an amount of energy that makes it usable to supply energy for chemical reactions in cells.

3– ATP is a high–energy molecule because the last two phosphate bonds are unstable and easily broken.

4– Usually in cells, the terminal phosphate bond is hydrolyzed, leaving the molecule **ADP (adenosine diphosphate)** and a molecule of inorganic phosphate P.

5– The energy released by ATP breakdown is used by the cell to synthesize macromolecules such as carbohydrates and proteins.

Lab media and its types

Culture media: Balanced mixture of different nutrients necessary for the growth of microorganisms, it may be simple or complex composition in each case serves to provide the energy and basic units for building cells.

The purpose of using Culture media: Growing and preserving fungi.

Study the effect of single nutrients found in media on the growth of fungus
Inducing fungi to produce and forming some material. Classification of fungi and study the cultural characteristics.

Culture media are divided According to the chemical composition into three types:

1. Natural media
2. Synthetic media
3. Semi Synthetic media

Natural media: Use of natural materials without additions, ex: Extracts of the roots of potatoes or carrots, Prepared from wheat or barley or corn. Synthetic media: Must be known composition, consists of metal salts have added some sources of carbon or nitrogen can be prepared each time the same precision ex: Czapek's Agar (CZ).

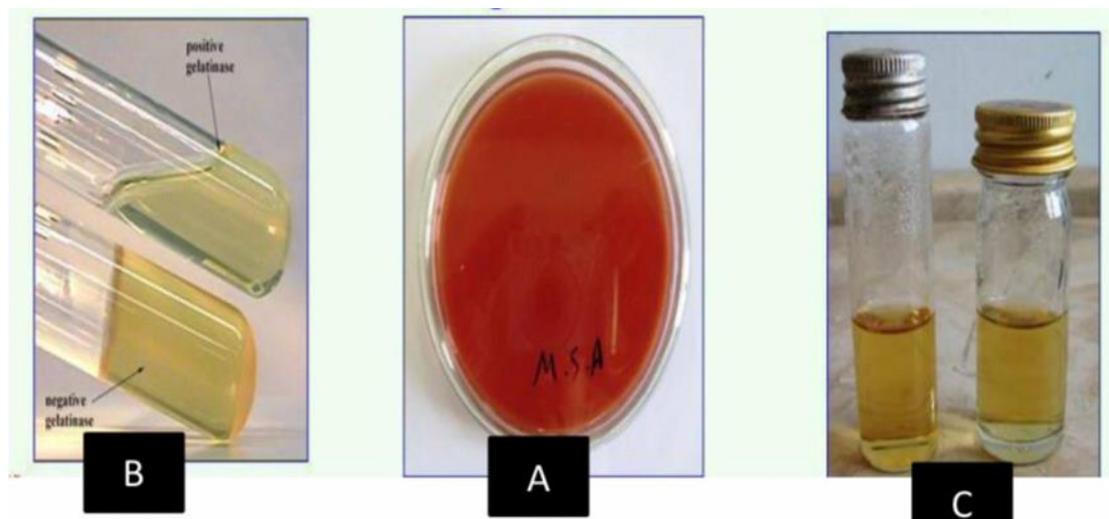
Semi Synthetic media: Not have a specific composition, composition changed depending on the nature of the material prepared, Difficult prepared each time the same precision ex: Potato Dextrose Agar (PDA), Corn Meal Agar (CMA), Malt extract agar.

Culture media are divided According to the physical condition into three types:

A_ Solid media: It may be natural such as potato chips, or it may be artificial, such as (PDA) Containing (Agar).

B_ Semi solid media: Contains a half or a quarter of the amount Agar added to solid media.

C_ Liquid media: Not contains Agar such as (PD) artificial(Milk) natural.



powder in Preparation of Culture Media General

1- Broth & agar media are prepared by dissolving specified amount of distilled water.

2- Boiling is often required to dissolve the powder by autoclave in 121 C° for 15-20 min.

3- Cool the flask containing the culture media to about 50 C°

4- Pour the culture media on the Petri dishes let it until Solidify.

CHROMagar Media :

This test is performed by inoculating CHROM agar Candida medium which is prepared previously from Candida isolate culture grown on SDA for 24 h, and then incubated at 30°C for 24–48 h. CHROM agar test is used for the presumptive identification of Candida species by production of different colors on this medium (*C. albicans* = green/ blue green, *C. dubliniensis* = dark green, *C. tropicalis* = blue, *C. parapsilosis* = cream white, and *C. krusei* = pink)

