ملخص وشرح الدرس الرابع life of blocks Building من الوحدة الأولى منهج انسباير

المزيد من الملفات بحسب الصف التاسع المتقدم والمادة علوم في الفصل الأول

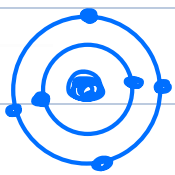
1	ملخص وشرح الدرس الثالث solutions its and Water من الوحدة الأولى منهج انسباير
2	ملخص وشرح الدرس الثاني reactions Chemical من الوحدة الأولى منهج انسباير
3	ملخص وشرح الدرس الثالث transport Cellular من الوحدة الثانية منهج انسباير
4	ملخص وشرح الدرس الثاني membrane plasma The من الوحدة الثانية منهج انسباير
5	ملخص وشرح الدرس الأول theory and discovery Cell من الوحدة الثانية منهج انسباير

بسم الله الرحمن الرحيم Bio 14 : Building Blocks of life G9 ADV Tj 2025

* Macromolecules *

matter

- **Organic**: matters that consist of **carbon** in its basic structure.
- **inorganic**: have no carbon.



→ Carbon has 6 electron.

→ the outermost energy level contain 4 electrons.

→ allows carbon to make 4 covalent bonds with other elements.

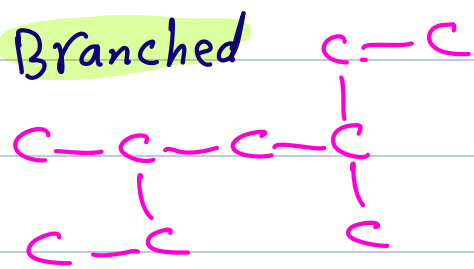
→ Scientist have devoted an entire branch in chemistry called **organic chemistry**.

+ Organic Compounds :

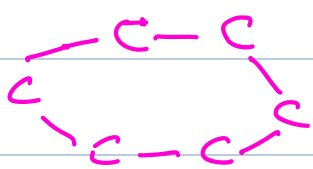
- Are compounds that contain **carbon** atoms in its structure.
- Can take 3 different shapes :

Straight

Branched



Ring



Allows to found differentiation like on earth.

Macromolecules :-

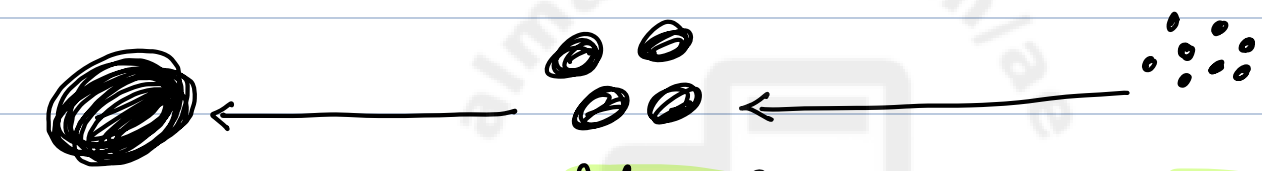
↳ Large molecules That are formed by joining smaller organic molecules.

Polymers :-

↳ molecules made from smaller units.

Monomers :-

↳ Smallest units That are linked Together by a series of covalent bonds.



macro. Polymers monomers.

$C_6H_{12}O_6$ $Co_2 + H_2O$ C H O

* Macromolecules *

	Basic unit	Types
Carbohydrates	سكريات بسيطة monosaccharides.	monosaccharid, disacch., Polysacch.
Lipids	الأحماض الدهنية Fatty acids	saturated, unsaturated, Polyunsaturated, phospholipids, steroids.
proteins	الأحماض الأمينية Amino acids	1000 types.
Nucleic acids	النيوكليوتيد Nucleotide	DNA, RNA.

[1] Carbohydrates (Carbs)

→ Compounds composed of $C_nH_{2n}O_n$ in a ratio C : H : O = 1 : 2 : 1.

$(CH_2O)_n$

* Formaldhide group *

n → numbers of Formaldhide group in the compound.

n = 3 : 7 → monosaccharide → $(CH_2O)_6$ → $(C_6H_{12}O_6)$

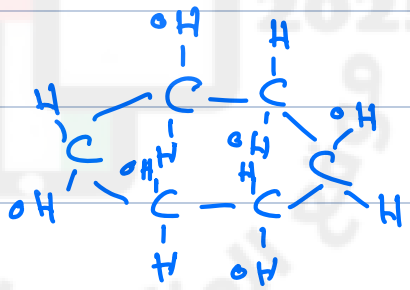
= 8 : 14 → disaccharide

= 15 ; ∞ → polysaccharide

→ Carbs 3 groups :-

① Monosaccharide :-

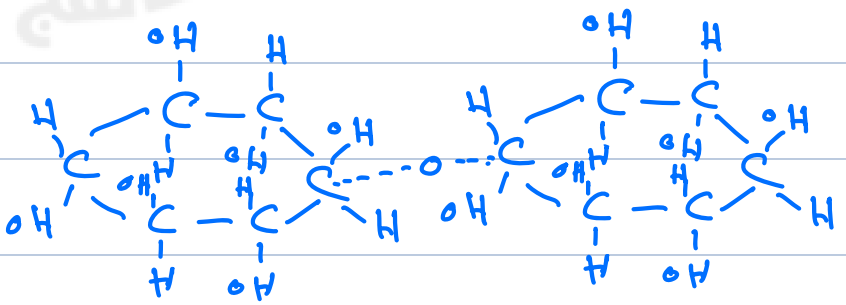
ex :- glucose , Fractose.



② Disaccharide :-

2 mono joined together.

ex :- Maltose , Lactose.



③ Polysaccharide

glycogen جليكوجين
* energy storage in Liver and skeletal muscle.

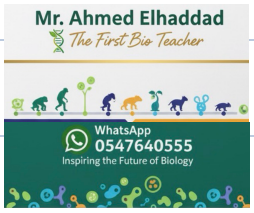
cellulose سليلوز
* provide structure support in cell walls.

chitin كيتين
* The complexed Compounds in all

* glycogen broken down into glucose to help body to get energy.

* Made from chains of glucose.
* give plants strength and solidity.

* Contain nitrogen (N_2) in its chains.
* found in hard outer shells of shrimp, lobsters, insects, some fungi.



Humans body cannot digest some of Polysaccharides // // carbohydrates?

Because human's digestive system doesnot have enzymes could digest complex carbs.

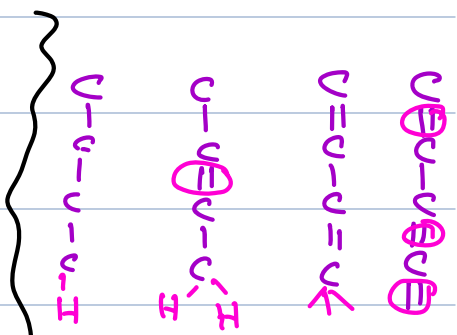
2 Lipids

→ molecules made of C and H.
→ make up fats, oils, waxes. الشمع
→ Lipids composed of fatty acids + glycerol.
→ Triglyceride 2 cases in room temperature.

- Solid, called fat
- Liquid, called oil

① saturated المشبعة

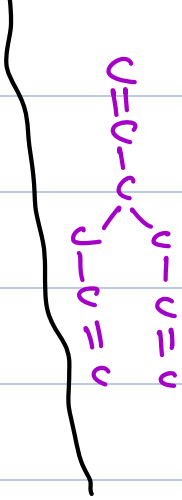
- chain of C atoms bonded to hydrogen.



- Bonds between carbons are single.

② unsaturated الغير مشبعة

- chain of C atoms bonded to 2 hydrogen.
- At least, there are 1 double in chain.

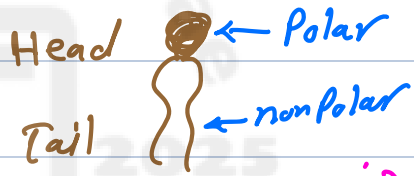


③ Polyunsaturated الغير مشبعة بكثرة

- chain of C atoms bonded to more than 2 hydrogen.
- More than one double bonds in chain.

④ Phospholipids الدهون الفسفورية

- Responsible for structure and function of the cell membrane.
- Hydrophobic كارهة للماء
  - do not dissolve in water.
  - important because allows lipids to serve as barriers حواجز in biological membrane.



⑤ Steroids الستيرويدات

- Cholesterol
  - play important role in making VD
- Hormones
  - estrogen ♀
  - testosterone ♂

3 Proteins

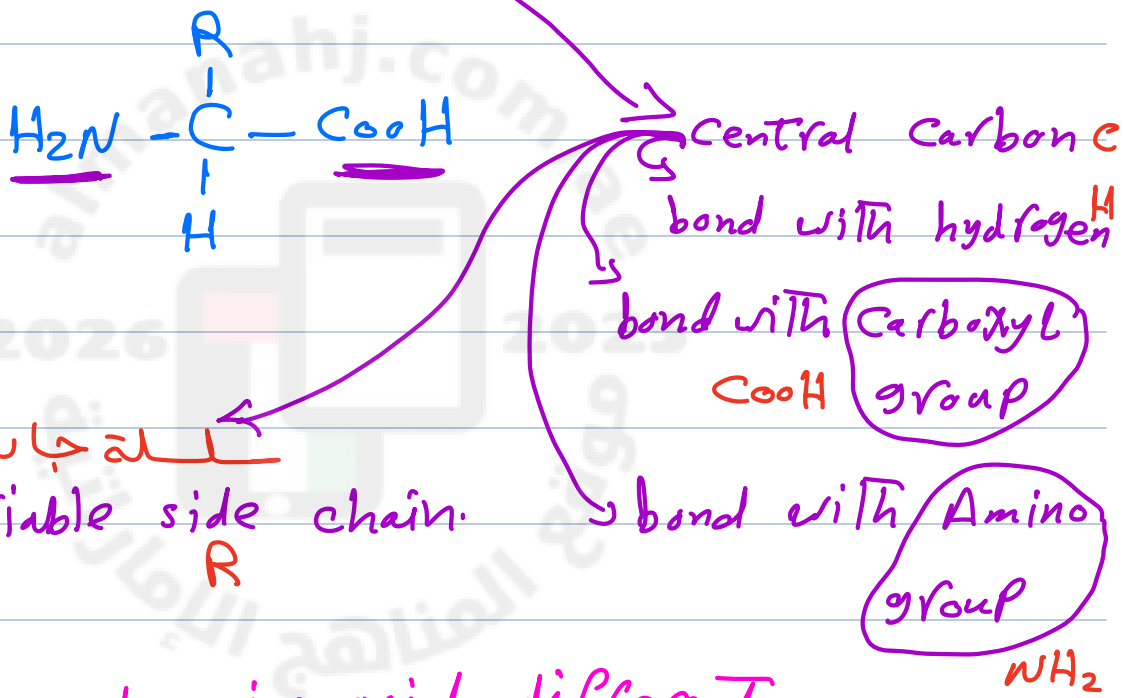
→ is compounds made of Amino acids

made of C, O, H, N and sometimes S (sulfur) كبريت

→ There are 20 amino acids in human body.

make 10 000 different proteins.

→ All amino acids have similar structure.

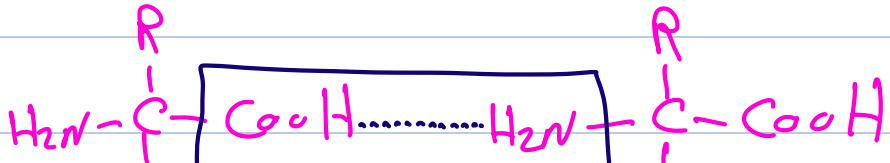


This (R) makes each amino acid different.

(رابطة ببتيدية)

→ Amino acides bond together by Peptide bond

is a bond between carboxyl group (COOH) in one amino acid and amino group (NH_2) in other amino acid.



H H

Amino acid — peptide group → Amino acide

CooH ---------- H_2N

* proteins play arole in nearly every function of your body. make up about 15% of Total body mass.

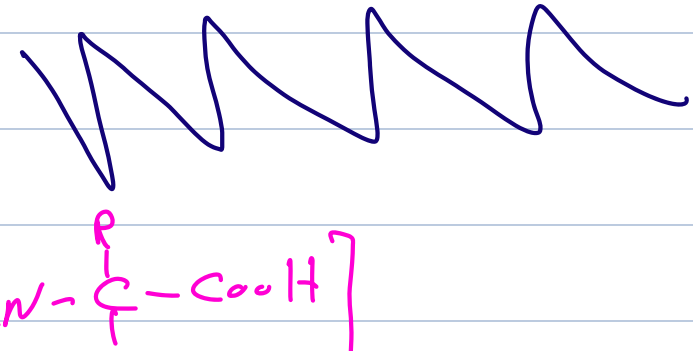
① your muscles
② your skin
③ your Hair
} proteins.

100 kg
15 kg protein.

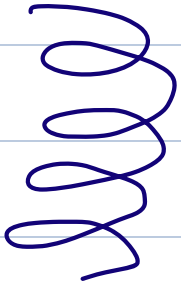
④ Speed up chemical Reactions (Enzymes)
⑤ Help in control cell growth.

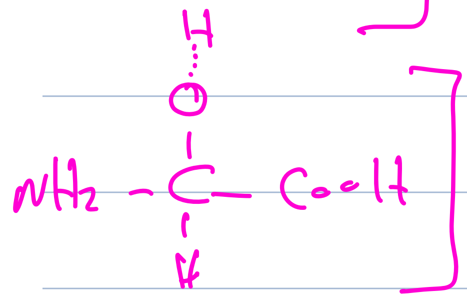
* proteins shapes:
↳ depends on the interactions among the amino acids.
↳ selected by hydrogen bonds between H and O.

Pleated sheet



Helix





DNA store genetic info.
RNA copy " " .

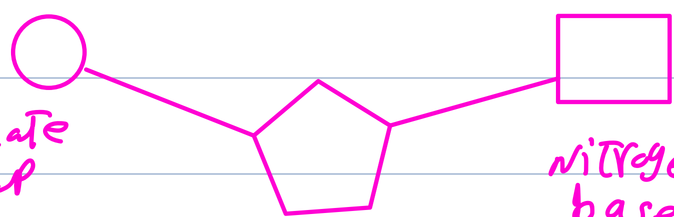
4 Nucleic acids

→ Complex macromolecules.
→ Store and transmit genetic info.
→ The basic unit is nucleotides.

DNA — deoxyribonucleic acid (lose O_2)
RNA — ribonucleic acid

made of C, N, O, H, P
فوسفور
Phosphorus

التركيب
(structure)



Phosphate group (PO_4)

sugar
- In DNA: deoxy — منقوص الاكسجين
- in RNA: ribo — غير منقوص الاكسجين

Nitrogen base → 5 Types

in DNA	in RNA
A	A
G	G
T	U

A adenine

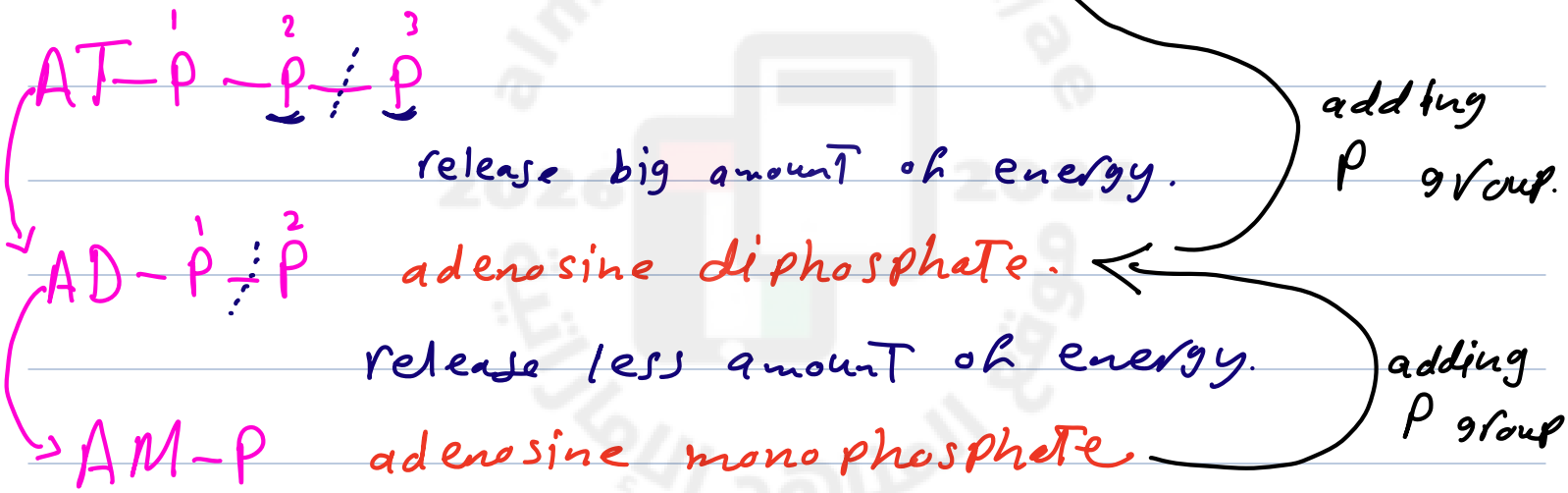
G guanine

C cytosine

T Thyamine (DNA)

U Urasil (RNA)

ATP Adenosine Triphosphate. energy store house.



when you need energy, the phosphate bond between phosphate groups broken and release energy and converted ATP into ADP then AMP.

when your body build energy storehouse, added new phosphate groups and store energy and then converted AMP into ADP into ATP. *end of lesson*