Slide :.....1.....

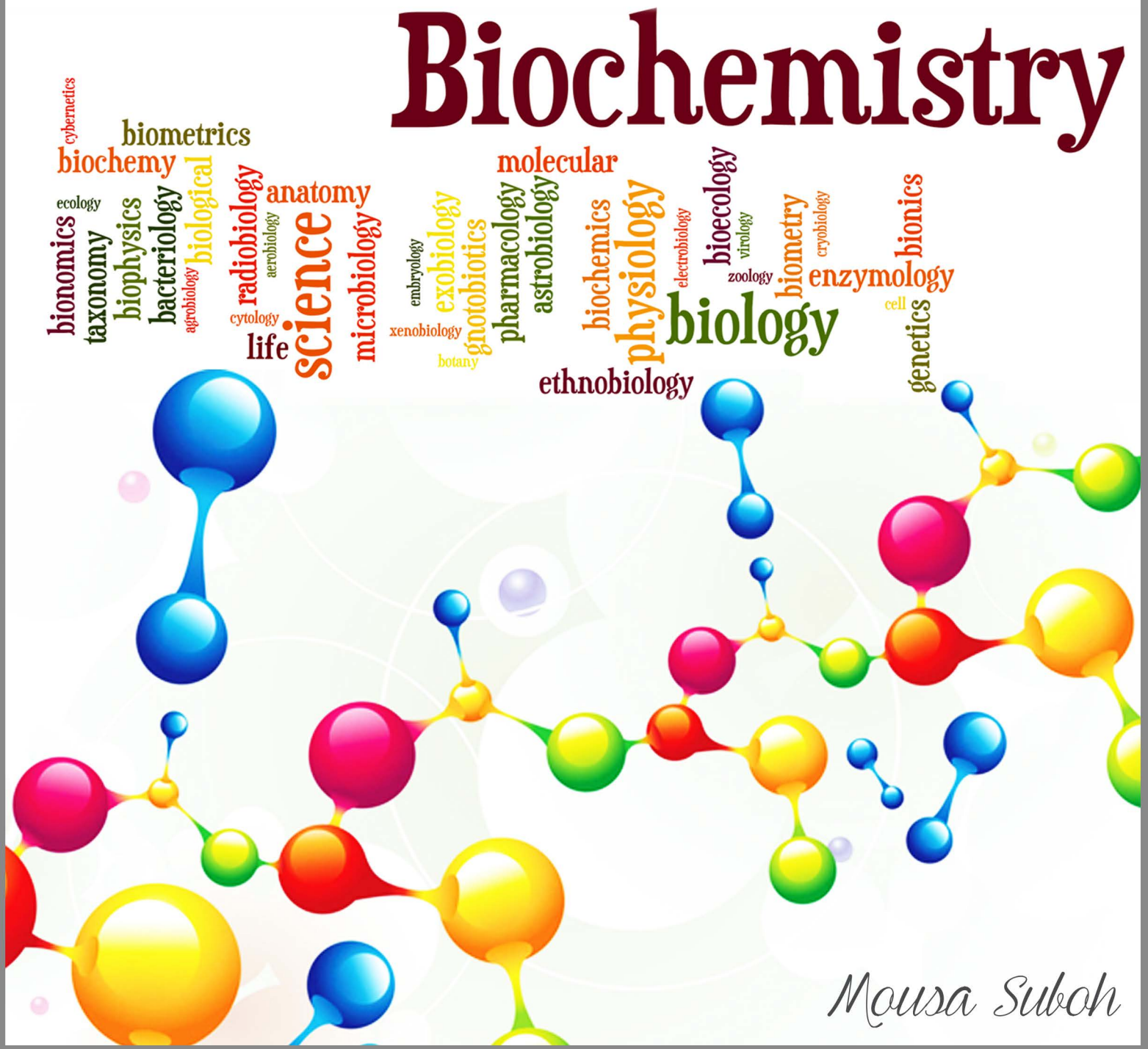
Dr. Name :.....Nayef Karadsheh.....

Sections : ...4 , 5 , 6...

■ Slide ☐ Sheet

Medical Committee
The University of Jordan

Biochemistry



Mousa Suboh

Enzymes Nomenclature

I Shortnames - recommended + convenient

- substrate + "ase"
  e.g. glucosidase, urease, sucrase
- "ase" added to description of the action
  lactate dehydrogenase, adenyl cyclase
- trivial names
  trypsin, pepsin

II Systematic name

Enzyme Commission (EC) of the IUBMB classified enzymes into six major groups according to type of reaction catalyzed. The suffic ase is added to a fairly complete description of the chemical reaction catalyzed

e.g. D-glyceraldehyde 3-phosphate:NAD oxidoreductase

glucokinase (common name)
ATP: D-hexose 6-phosphotransferase
EC number is: (EC 2.7.1.2)

2 → EC general class (transferase)

7 → e.g subclass for transfer of phosphorus-containing group

1 → refers to transfer to an alcoholic acceptor (sub subclass)

2 → specific number of the enzyme

1. Oxidoreductases

- Very common reactions and a broad class

- e.g. dehydrogenases
  accepts or donate hydride ions or hydrogen atoms

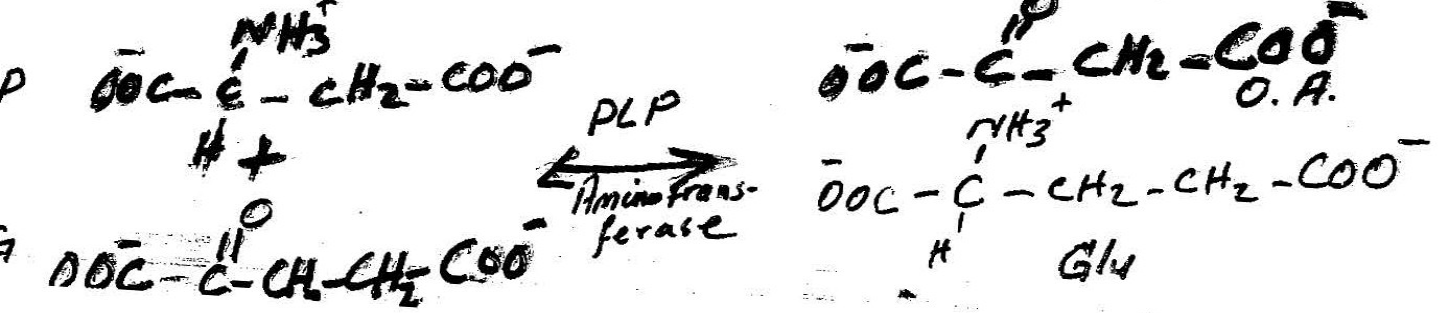
- i hydroxylases, ii Oxidases → [O_2 → acceptor; O_2 → water] | Requires metal ion
- iii Oxygenase → O_2 (both) → acceptor

$$CH_3CH_2OH \xrightarrow{A.D} CH_3C(=O)H$$
$$+ NAD^+ \qquad + NADH + H^+$$

2. Transferases

Catalyze transfer of C-, N- or P-containing groups.

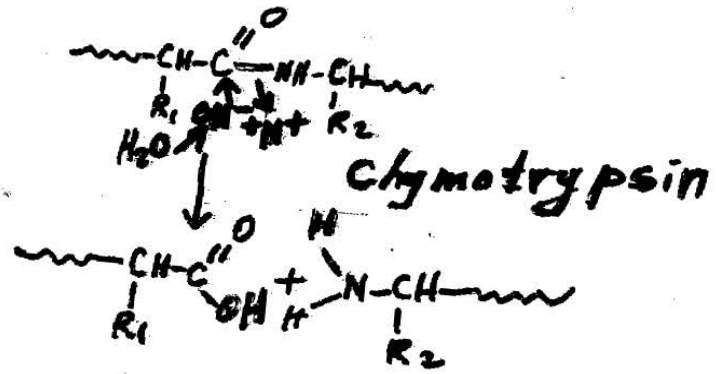
e.g.
- Kinase : transfer of ~P
- glycosyl transferase : carbohydrate residue (good leaving group)
- acyl transferase : fatty acyl group
- Aminotransferase or transaminases
- Syntheses : synthesis of physiologically impt. compd. e.g. GS.



3- Hydrolases

Cleavage of C-O, C-N or C-S bonds by addition of water OH^- and H^+

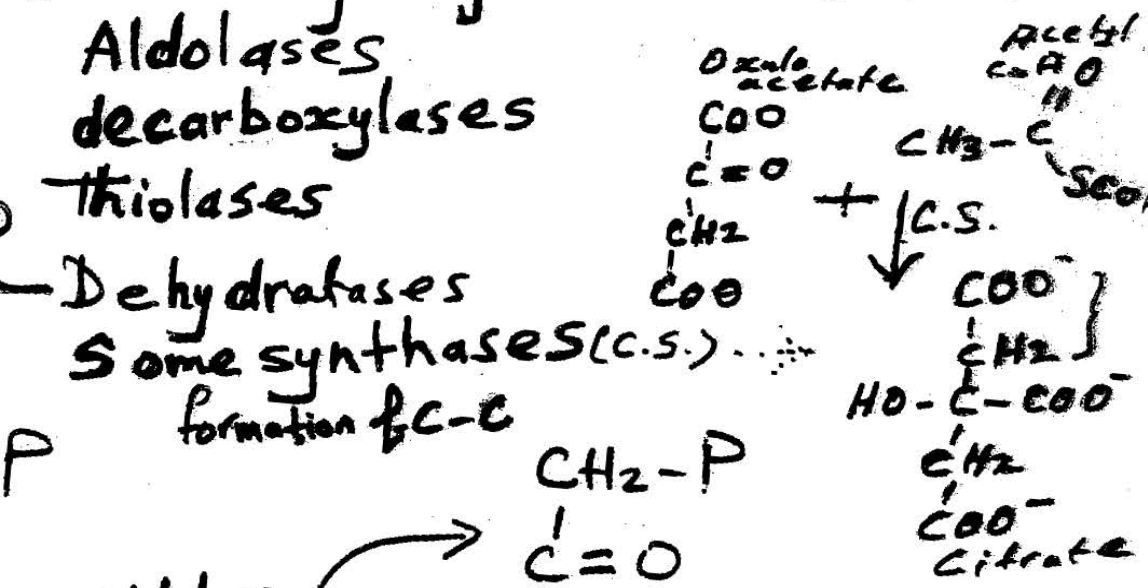
e.g. Proteases

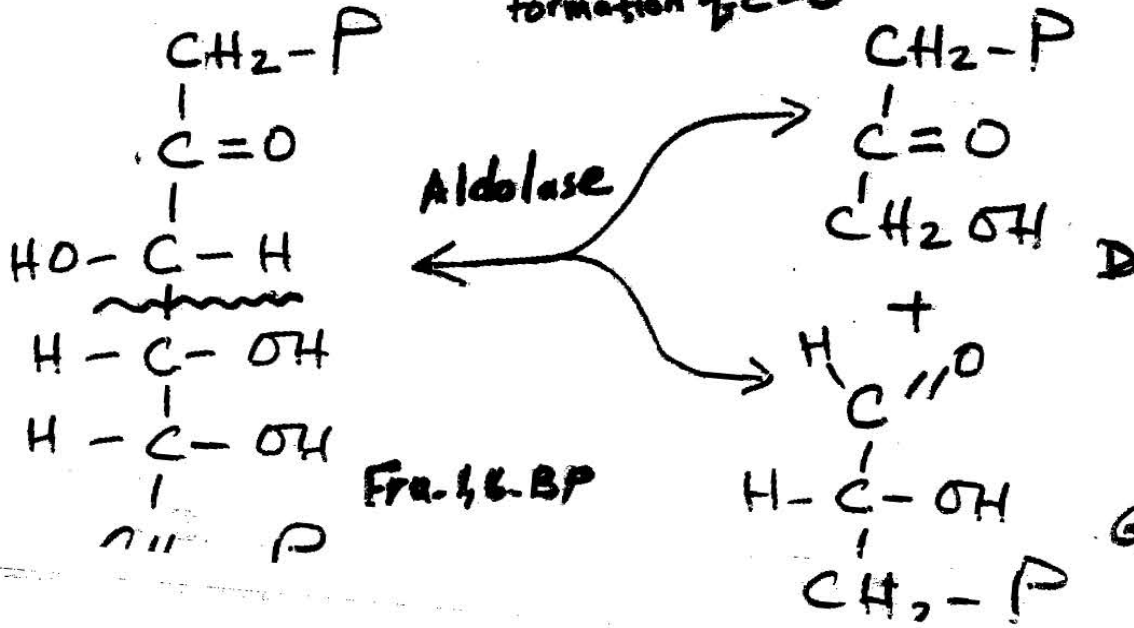


4- Lyases

Cleavage of C-C, C-O & C-N bonds by means other than hydrolysis or oxidation.

- Aldolases
- decarboxylases
- thiolases
- Dehydratases ← H_2O → double bond
- Some synthases (C.S.) ⋯ formation of C-C





Isomerases

Isomerases — rearranging bond structures (e.g. optical, geometrical isomers)

e.g. Mutases G6P ⟷ G-1-P

eg: DHAP (Ketotriose) ⟷ (Isomerase) GABP (aldotriose)

Ligases

synthesize C-C, C-S, C-O & C-N bonds coupled to cleavage of high energy phosphate bond

e.g. **Carboxylases:** Add CO_2, require biotin

Synthetases — to be distinguished from syntheses.

Synthetase are different from synthase under "Lyases" and "Transferases" as they derive energy from ATP

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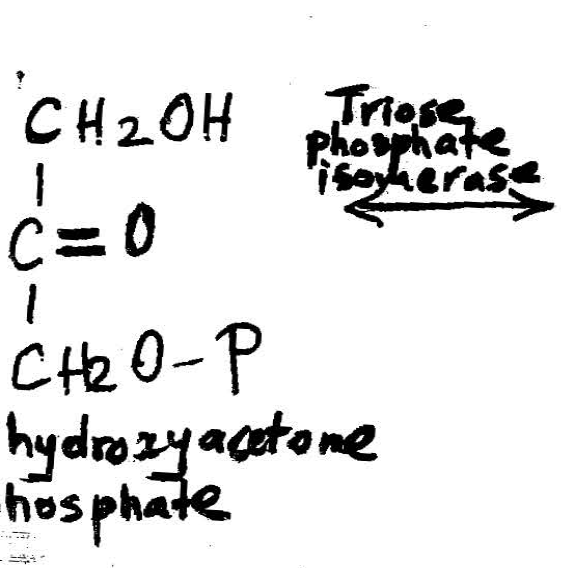
eg. for Isomerase



Dihydroxyacetone phosphate

Glyceraldehyde-3-phosphate