

TYPES OF ENZYME

By

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Types of Enzyme

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- **Oxidoreductases**
 - ▣ Oxidation reduction reaction
- **Transferases**
 - ▣ Transfer of Atom of group between two molecules
- **Hydrolases**
 - ▣ Hydrolysis Reaction
- **Lyases**
 - ▣ Removal of group from substrate (but not by hydrolysis)
- **Isomerase**
 - ▣ Isomerization reaction
- **Ligases**
 - ▣ Joining of Two molecules

Oxidoreductases

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- This enzyme catalyze the transfer of H, O or electron from one subject to another

H or Electron Donor Group

Alcohol – CHOH

Aldehyde or Keton – C=O

Amine – CHNH_2

NADH or NADPH

H or Electron Acceptor Group

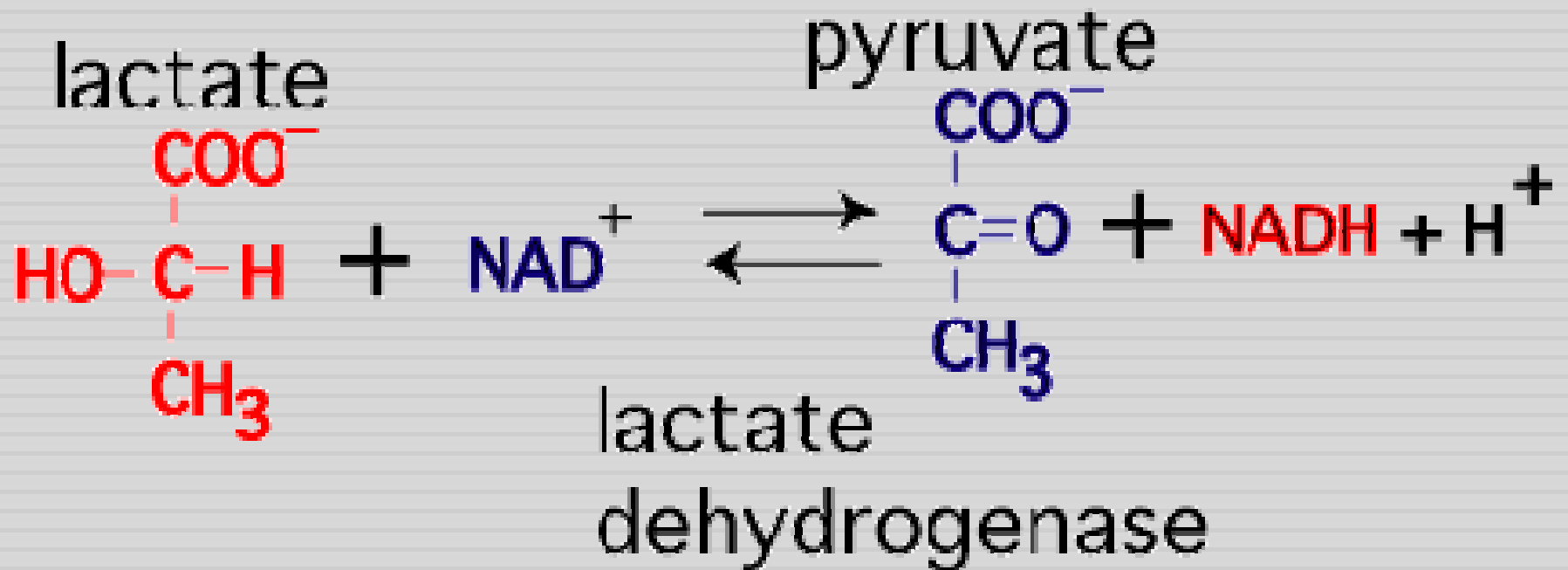
NAD^+ or NADP^+

Fe^{3+} (Cytochrome)

O_2

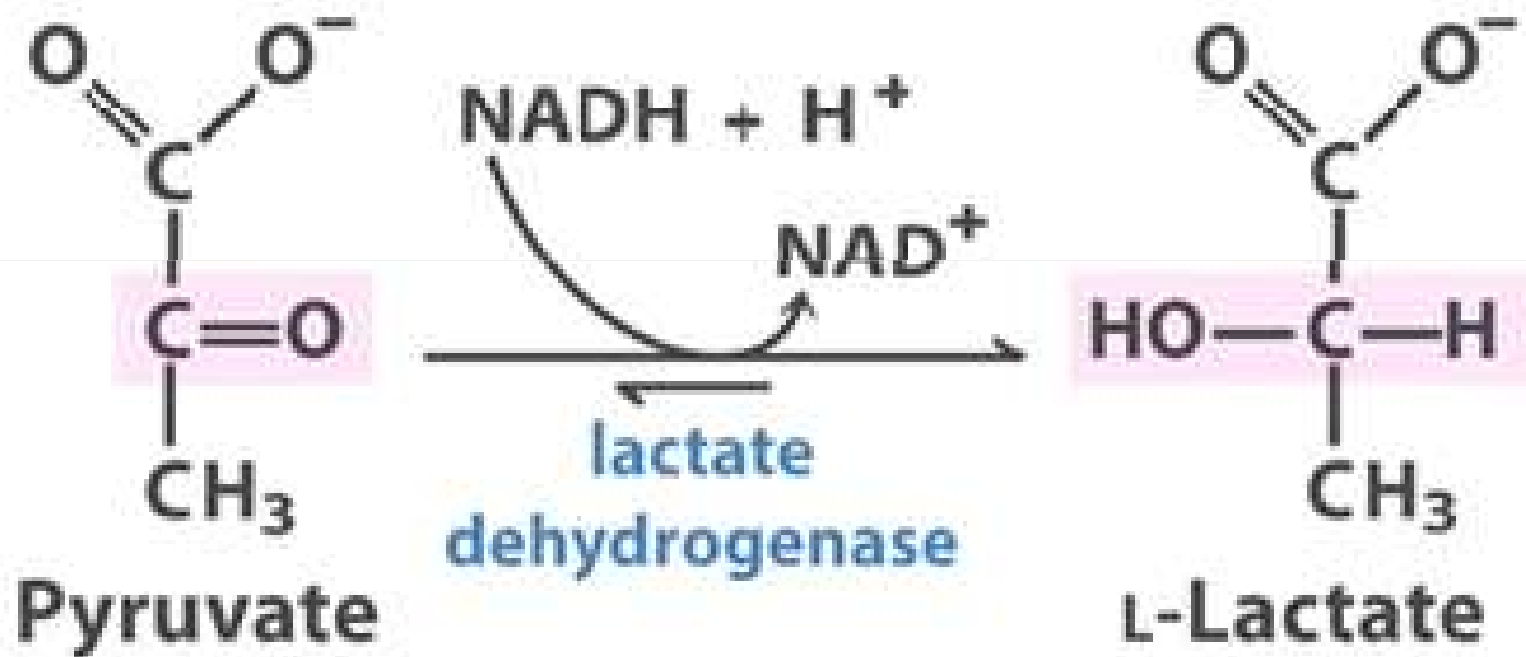
Oxidoreductases

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Oxidoreductases

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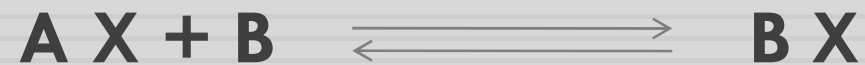


$$\Delta G'^{\circ} = - 25.1 \text{ kJ/mol}$$

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Transferases

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Transferred Group

1 Carbon group

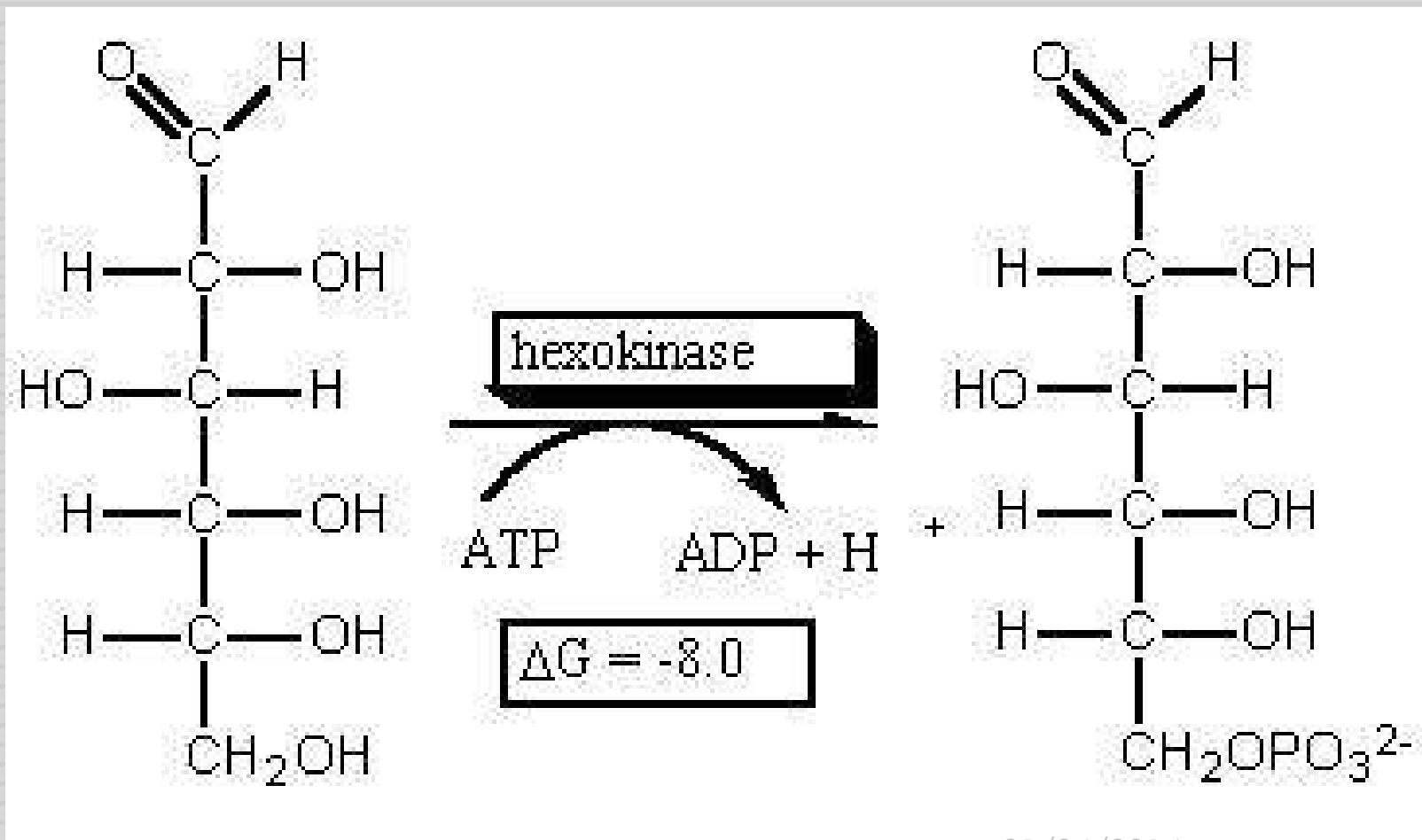
Aldehyde or Ketone Group (C=O)

Glycosyl (Carbohydrate) Group

Phosphate Group

Transferases

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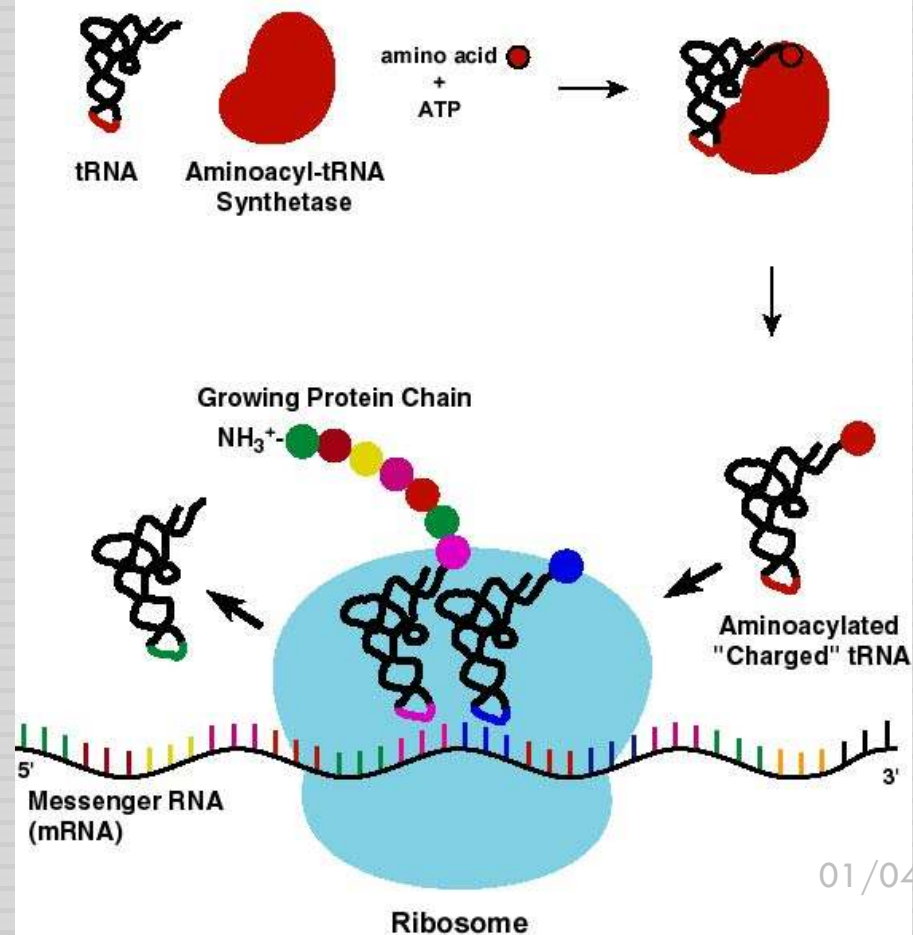


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Transferases

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Translation of the Genetic Code

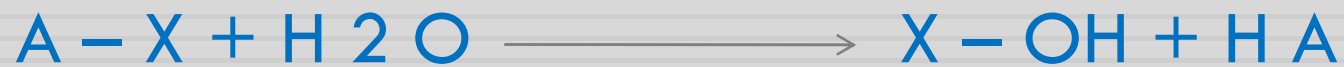


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Hydrolyses

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- These Enzyme catalyze hydrolytic reaction



Bond Hydrolyzed -

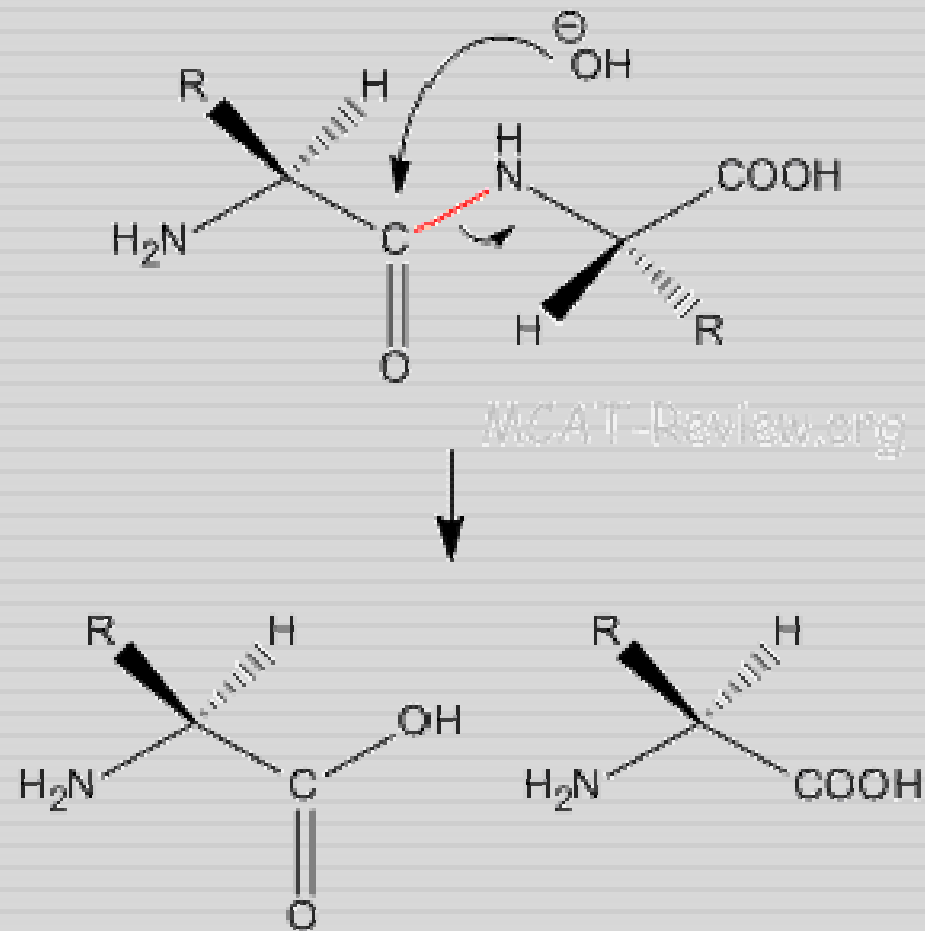
Ester

Glycoside

Peptide

Hydrolyses

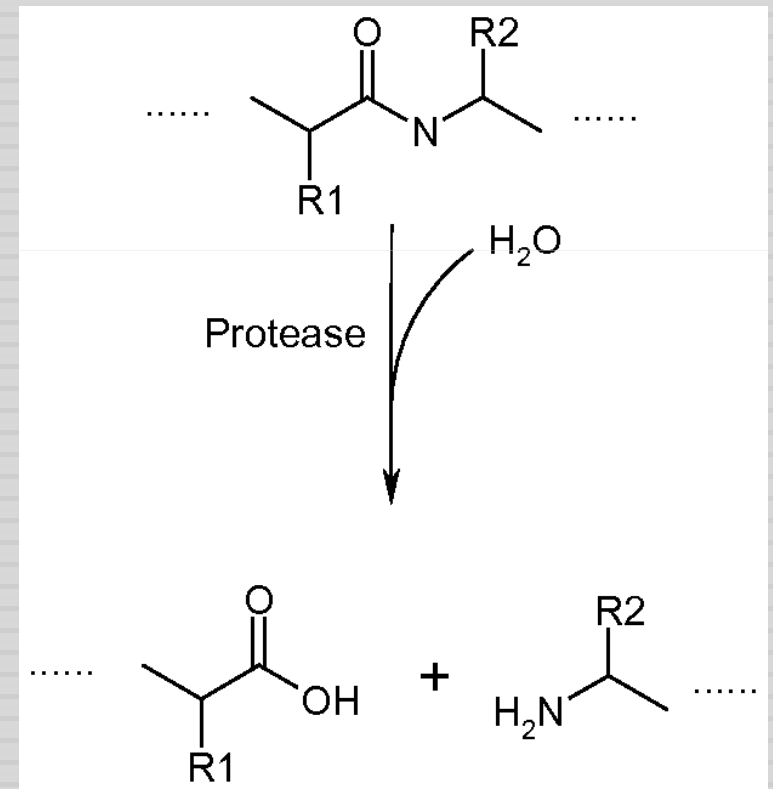
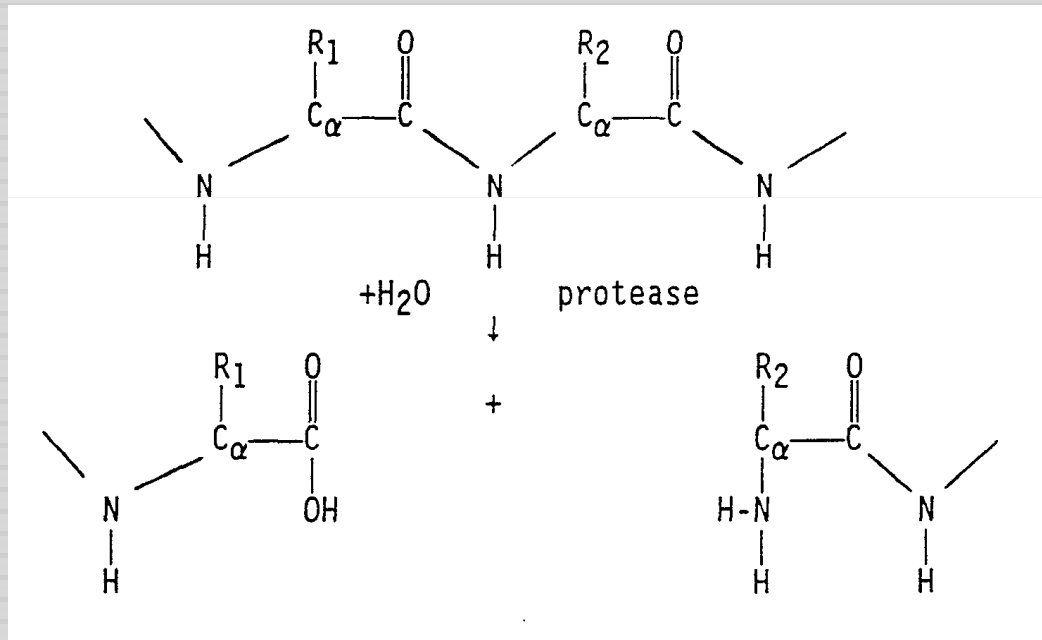
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Hydrolyses

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Lyases

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- The enzyme catalyze non hydrolytic removal of group from substrate

Bond Broken

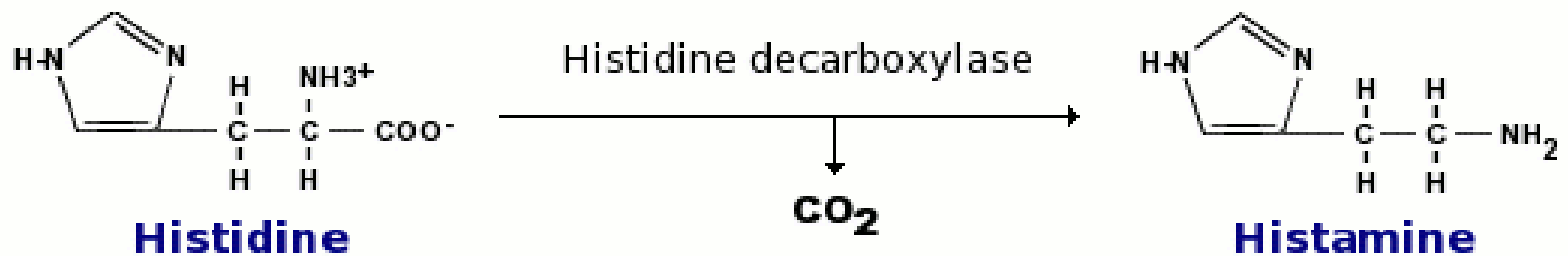
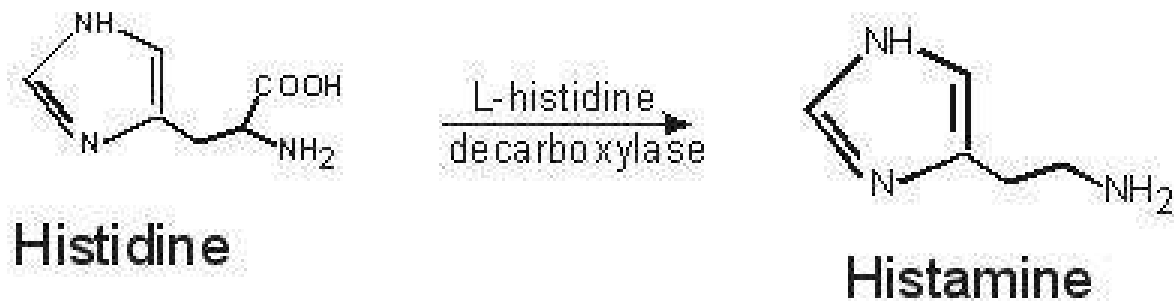
C – C
C – O
C – N
C – S

Group Removal

Carboxyl CO_2
Aldehyde $\text{CH} = \text{O}$

Lyses

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Isomerases

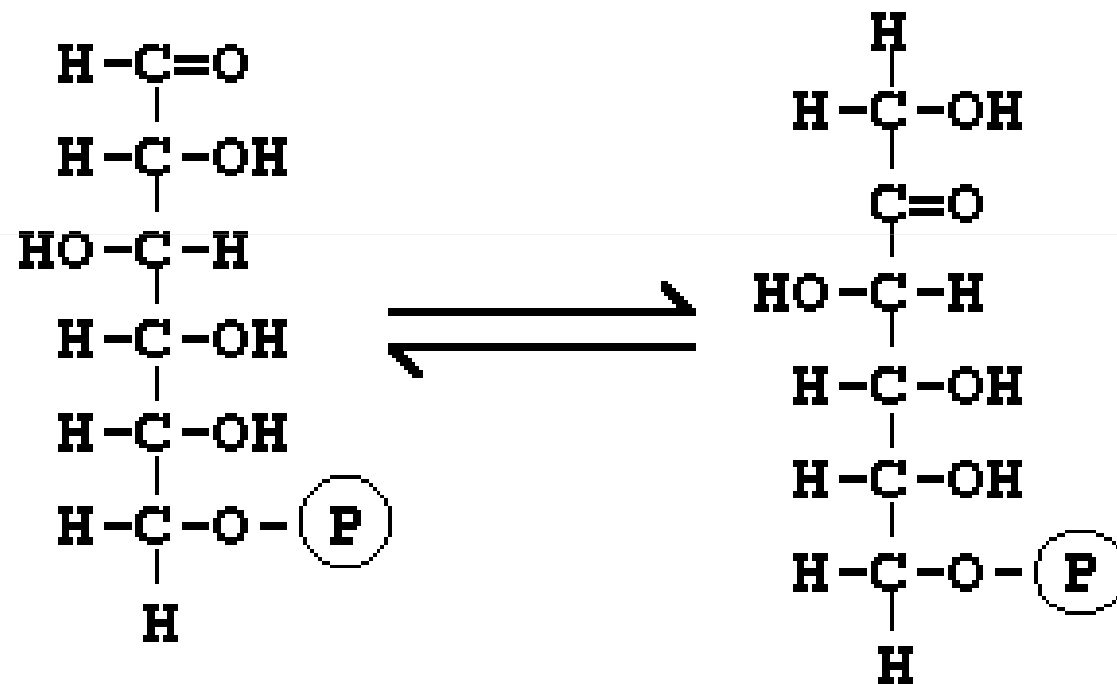
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- These enzyme catalyze isomerization reaction

- Molecules undergoing isomerization –
 - Amino acid
 - Hydroxyl acid
 - Carbohydrate

Isomerases

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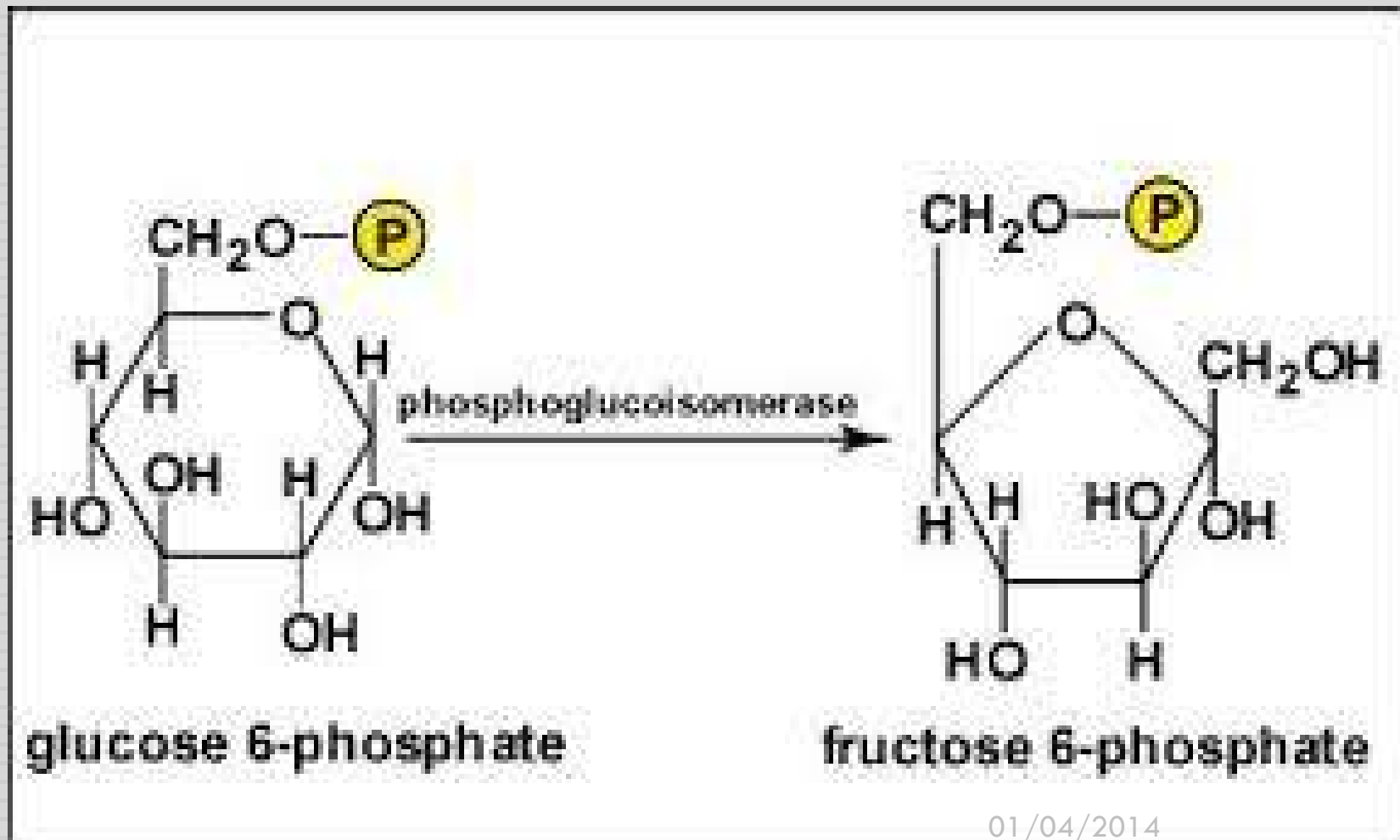


Glucose 6-phosphate

Fructose 6-phosphate

Isomerases

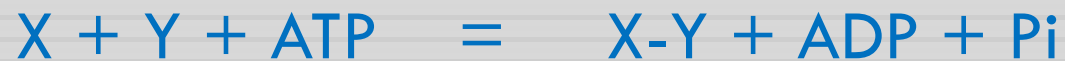
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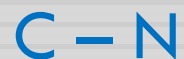
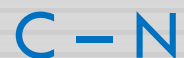
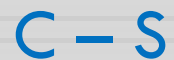
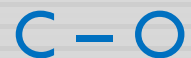
Ligases

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- These enzyme catalyses the synthesis of new bonds, coupled to the breakdown ATP or other nucleoside triphosphates -

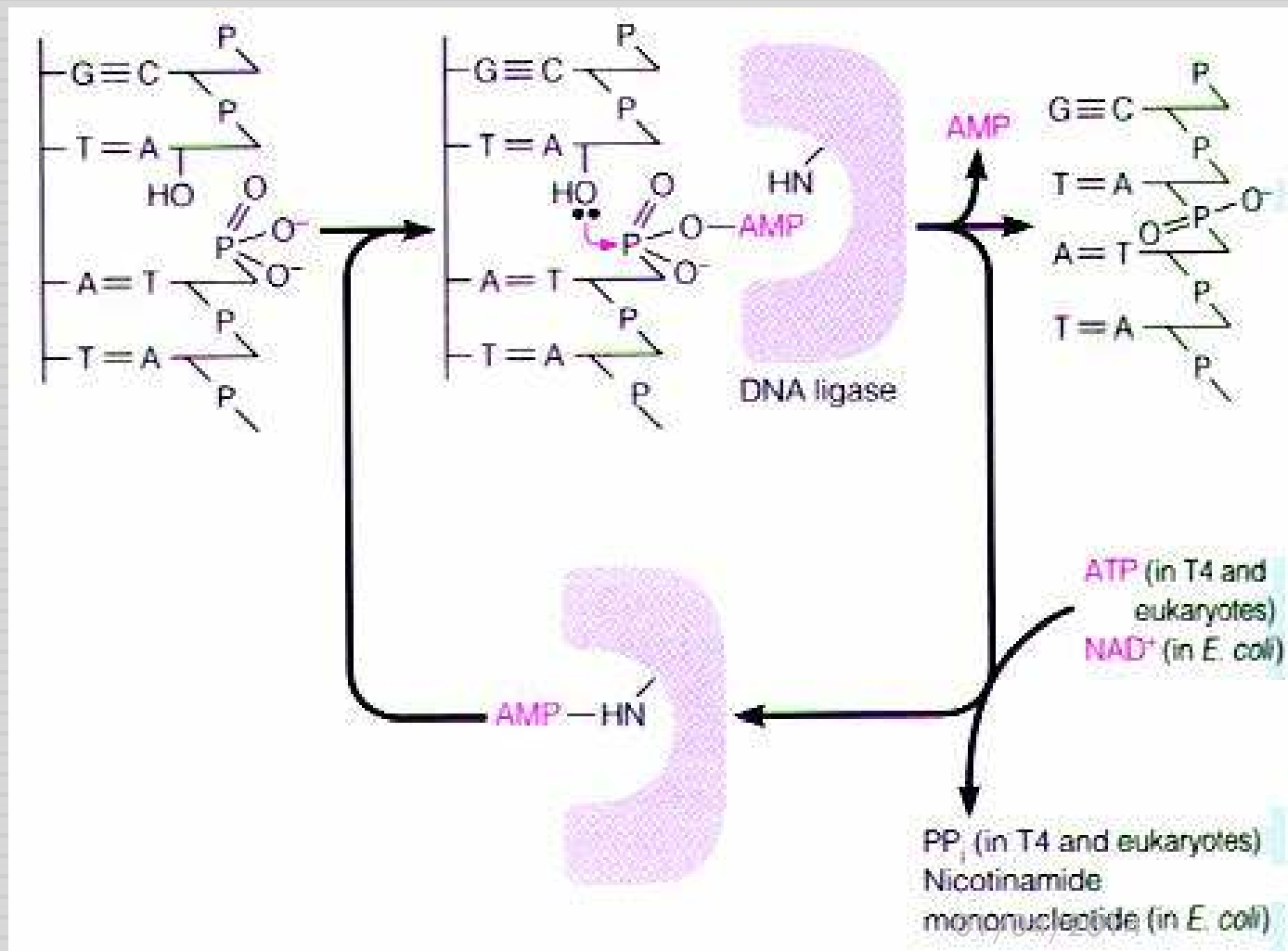


Bond synthesis –



Ligases

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Thank you