



# GLYCOLISIS

**SECOND YEAR STUDENT**

**PRESENTED BY: ABDALWAHED ALSAITY – WEGDAN BADI –  
ESRA ELANEIZI**

# ILOS



- Define glycolysis
- Discuss mechanism of glycolysis
- Outline the results of glycolysis
- Identify the importance of glycolysis
- Differentiation between aerobic and anaerobic in energy production

# DIFENTION



Glycolysis is the process in which glucose is broken down to produce energy (ATP) , pyruvate , ADH and water.

# Discuss mechanism of glycolysis

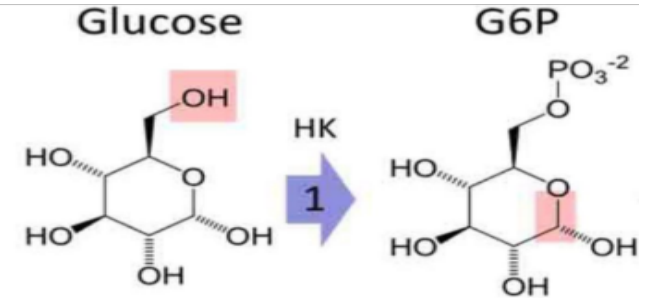


Glycolysis has 10 steps and it's about breaking down glucose into pyruvate molecules

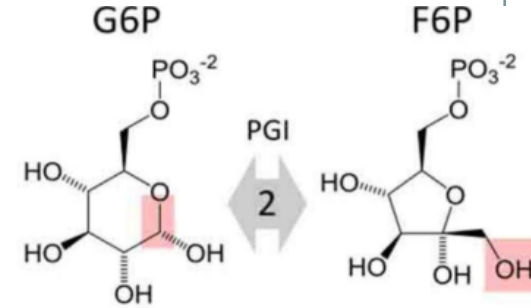
### 1- Kinase:



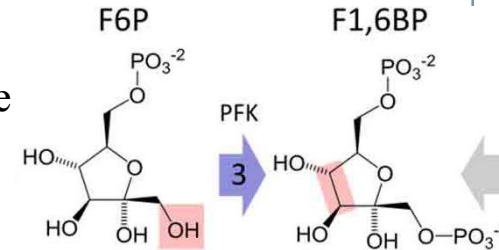
(-ATP)



### 2- Isomerase:

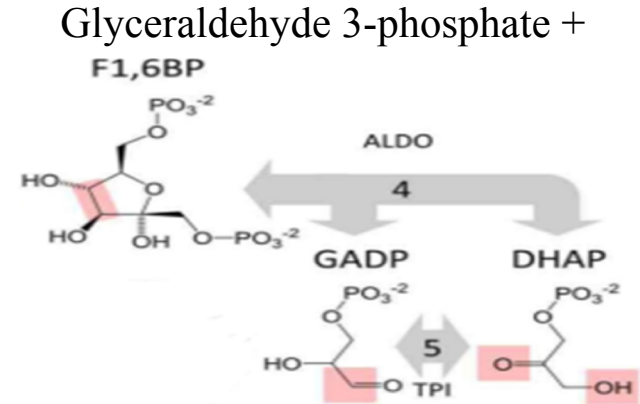


### 3- kinase:



## 4- Lyase:

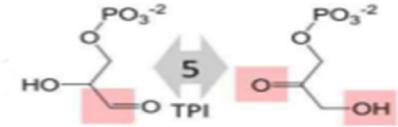
Fructose-1,6-bisphosphate **Fructose bisphosphate aldose**  
Dihydroxyacetone phosphate



## 5- Isomerase:

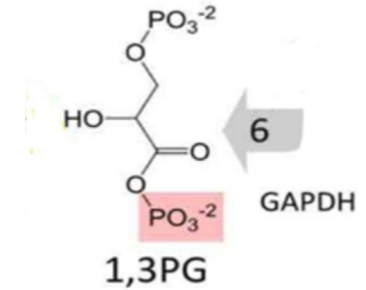
Dihydroxyacetone phosphate **Triosephosphate isomerase**

Glyceraldehyde 3-phosphate



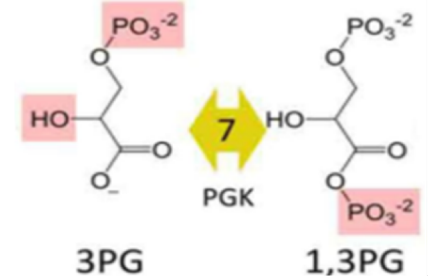
## 6- Dehydrogenase:

Glyceraldehyde 3-phosphate **Glyceraldehyde phosphate dehydrogenase**  
1,3- bisphosphoglycerate (+ATP)



## 7- kinase:

1,3-bisphosphoglycerate Phosphoglycerate kinase → ADP + 3-phosphoglycerate (+ATP)



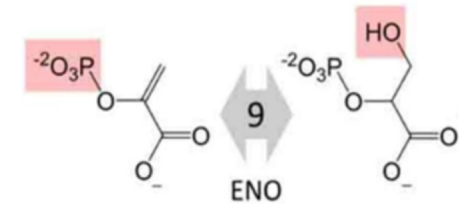
## 8- Mutase:

3-phosphoglycerate Phosphoglycerate mutase → 2-phosphoglycerate

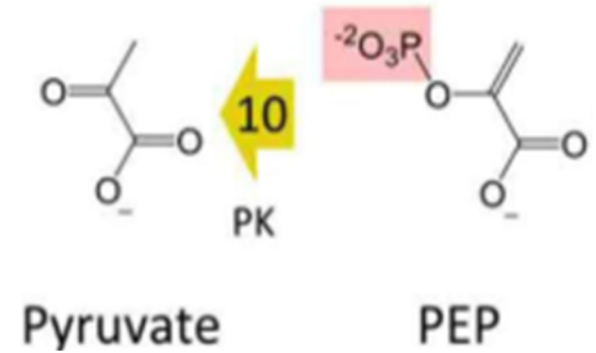


## 9- lyase:

2-phosphoglycerate Enolase → phosphoenol pyruvate



## 10- kinase:





# ENZAYMS RESULT



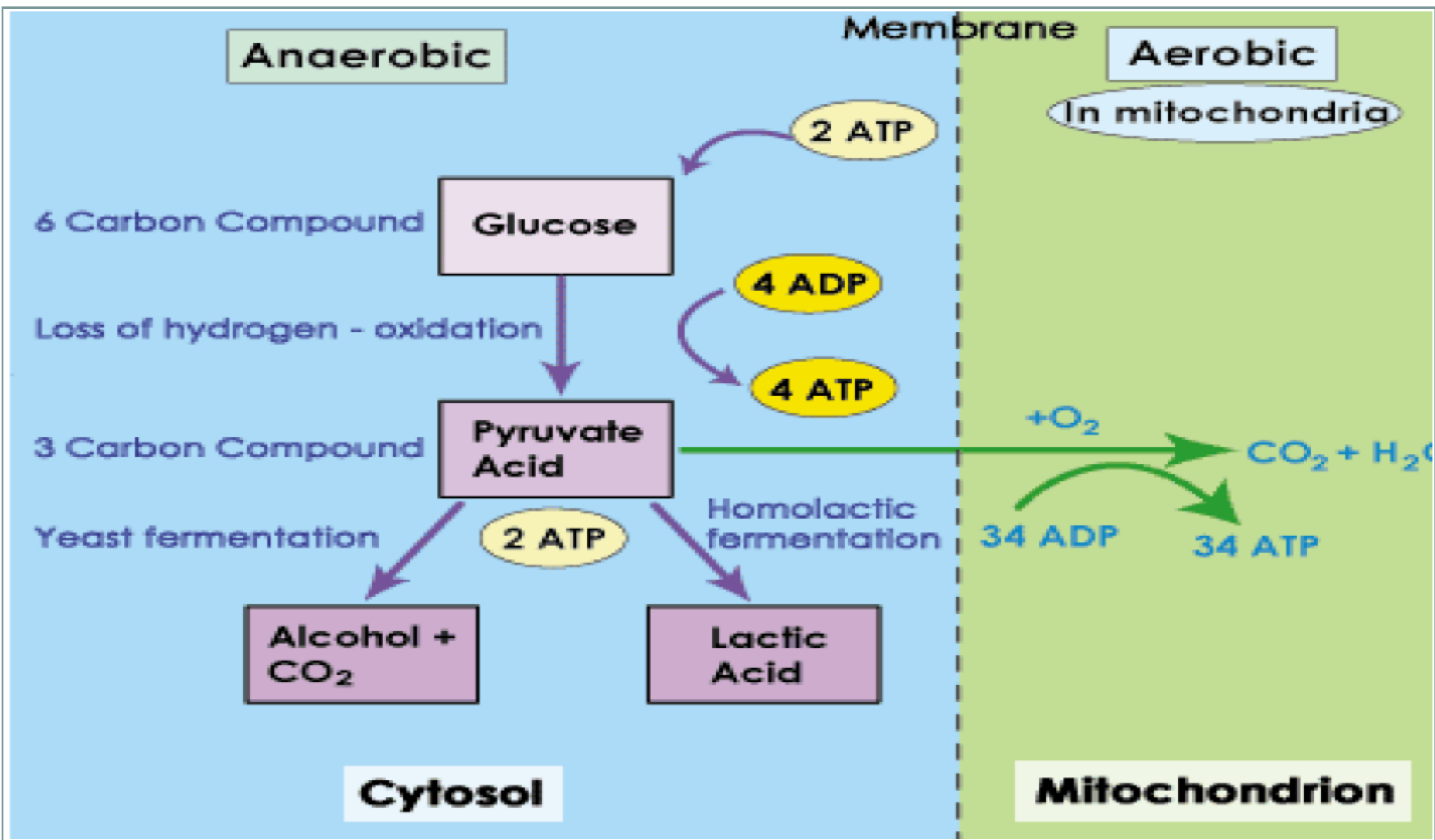
❖ **The overall process of glycolysis Results in The following events:**

- **In step 1 and 3:** 2 ATP has been consumed .
- **In step 6:** 2 NADH will produce 6 ATP .
- **In step 7 and 9:** 4 ATP has been produced .
- **Total:** 8 ATP.

# Importance of glycolysis



- 1. Glycolysis is the first of the main metabolic pathways of cellular respiration to produce energy the ATP**
- 2. Pyruvate the end product of glycolysis provides precursor for the TCA cycle( tricarboxylic acid cycle) and for the synthesis of other compounds**
- 3. Oxygenation of tissues formation of 2,3biphosphoglycerate , which decreases the affinity of hemoglobin to O<sub>2</sub>**



# SUMMARY

- **Glycolysis : breaking down the glucose to produce energy.**
- **The glycolysis goes through 10 steps as shown above; the first 5 steps is ATP consumption and the last 5 steps is manufacturing ATP.**
- **The end product of glycolysis it exhibits 2 paths (aerobic and anaerobic) in aerobic the process it done in the mitochondria while in anaerobic it done in the cytosol.**

# Reference



<https://microbenotes.com/glycolysis/?fbclid=IwARo8s5Cy44VqdGl2BFA7sIkmPPtuYnzKmASC8xUZodoIFVDYSBLPau46Ads>

Lippincotts Illustrated Reviews Biochemistry 3rd Ed

<https://www.differencebetween.com/difference-between-aerobic-and-anaerobic-glycolysis/>

Any question ?



*Thank you.*