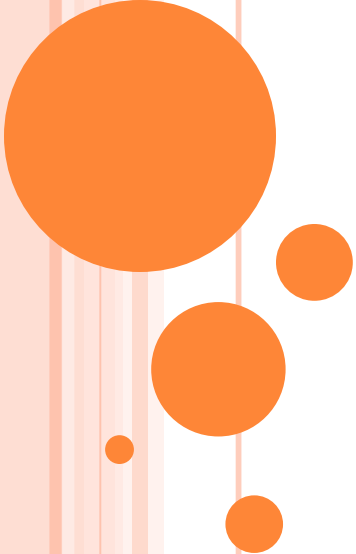




GLYCOLYSIS

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ENERGY PRODUCTION-INTRODUCTION

- Heterotrophic bacteria can use variety of organic compounds as energy sources.
- These compounds include
 - Carbohydrates
 - Organic acids
 - Fatty acids
 - Amino acids
- For many microorganisms the preferred compounds are carbohydrates, especially the 6-carbon glucose.



GLYCOLYSIS - INTRODCUTION

- **Glycolysis** - Splitting of sugar
- Glycolysis is **greek word** : **glycos** means **sugar** or **sweet** and **lysis** means **dissolution** or **degradation**.
- Glycolysis process occurs very widely and is found in microorganisms as well as in animals and plants.
- The most common pathway of glucose catabolism is the **Embden-Meyerhof pathway** of glycolysis.
- Glycolysis is a sequence of 10 reactions that is a that are enzyme catalyzed metabolic pathway.



ENERGY PRODUCTION IN GLYCOLYSIS

- The sequence of glycolysis reactions convert **glucose** into **pyruvate**.
- During this process **high-energy** compounds **ATP** (Adenosine triphosphate) and **NADH** (nicotinamide adenine dinucleotide) are produced.
- The process of glycolysis happens in the **extramitochondrial** portion of the cell.
- **Glucose** undergoes **partial oxidation** to produce two molecules of **pyruvic acid**.



STAGES IN GLYCOLYSIS

- The sequence of glycolysis reaction is separated into two phases - The preparatory phase and the pay-off phase.

Preparatory Phase

- Preparatory phase is the stage in which there is consumption of ATP and is also known as the investment phase.
- The first five steps of the glycolysis reaction is known as the preparatory or investment phase.
- This stage consumes energy to convert the glucose molecule into two molecules three-carbon sugar molecule.



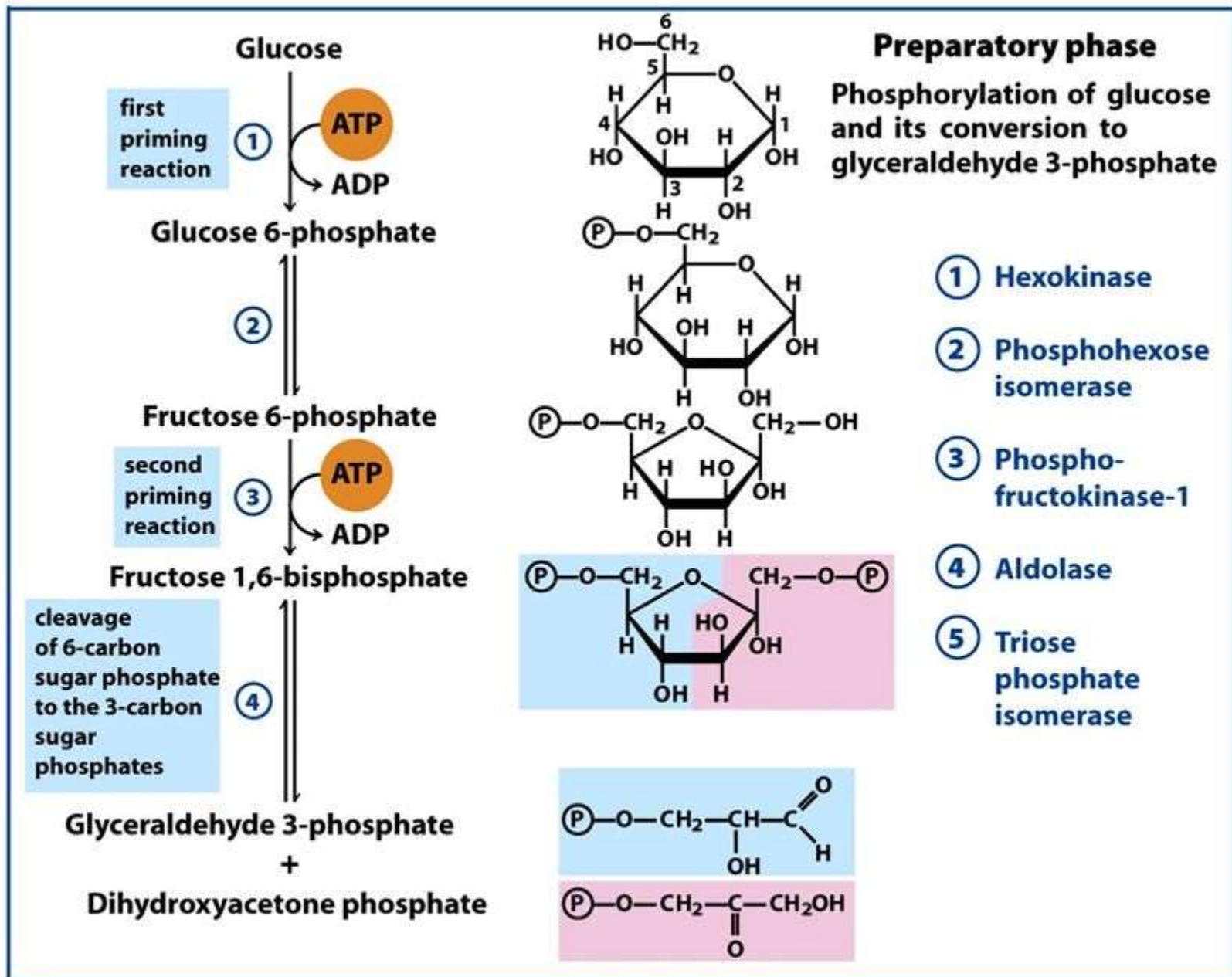


Figure 14-2a
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CONTI...

Pay-off Phase

- The **second phase** of glycolysis is known as the pay-off phase of glycolysis.
- The pay-off phase is where **ATP is produced**.
- This phase is characterized by **gain of** the energy-rich molecules **ATP and NADH**.
- Since glucose leads to two triose sugars in the preparatory phase, each reaction in the pay-off phase occurs twice per glucose molecule.
- This yields **2 NADH** molecules and **4 ATP** molecules, leading to a net gain of **2 NADH** molecules and **2 ATP** molecules from the glycolytic pathway per glucose.



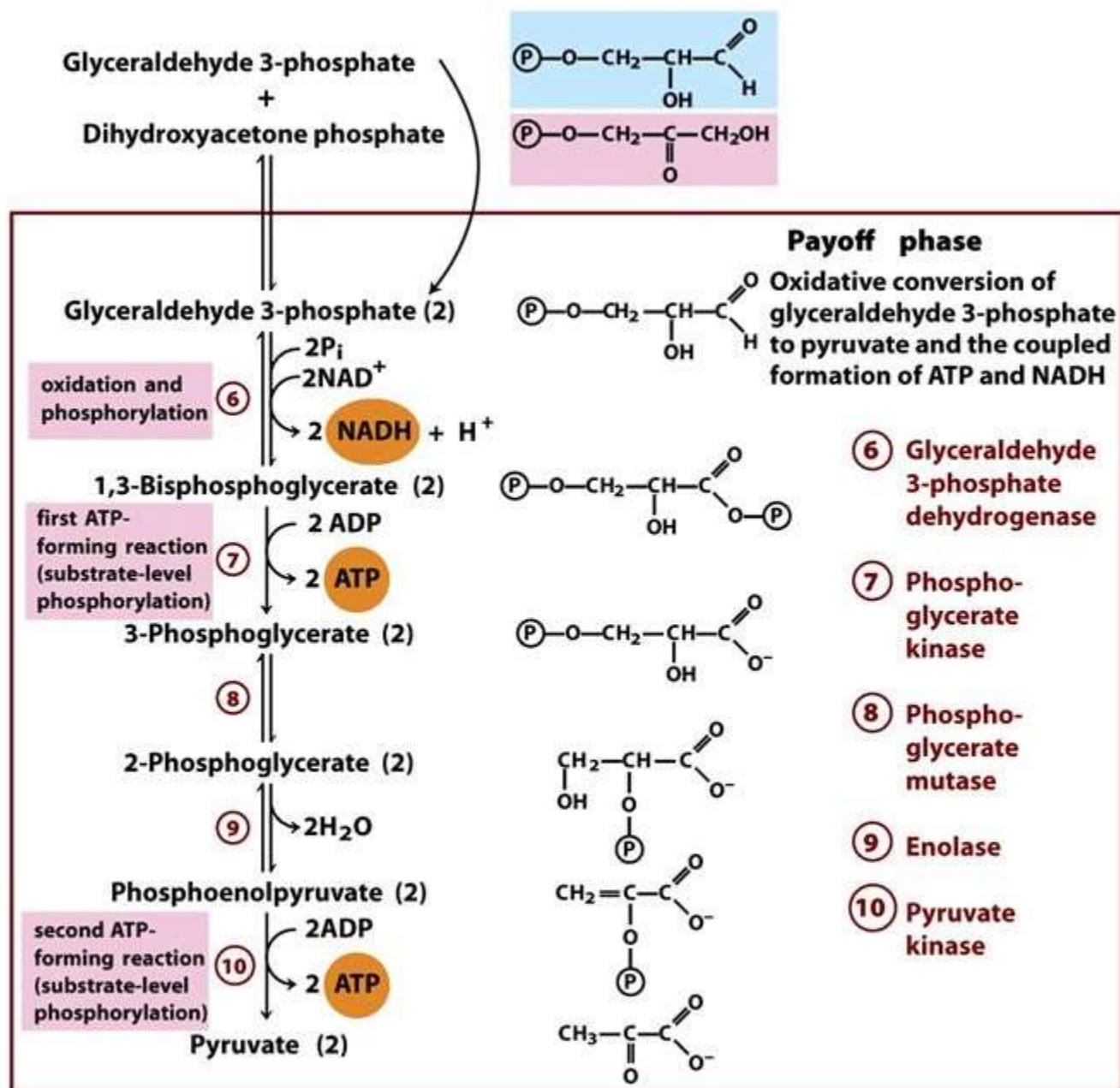


Figure 14-2b

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