

Fermentation

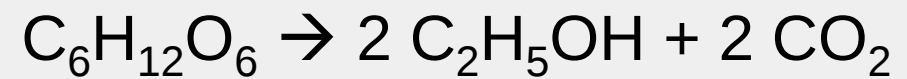
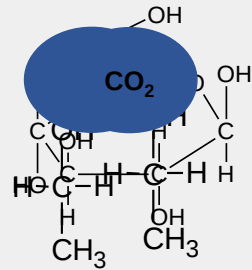
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Fermentation and yeast

- Fermentation: **a substance breaks down into a simpler substance**
 - metabolic process
 - organic molecules into acids, gases, or alcohol
 - absence of oxygen or any electron transport chain.
- Yeast: **single cell eukaryotic microorganisms**

Anaerobic Fermentation of Glucose with the use of Yeast

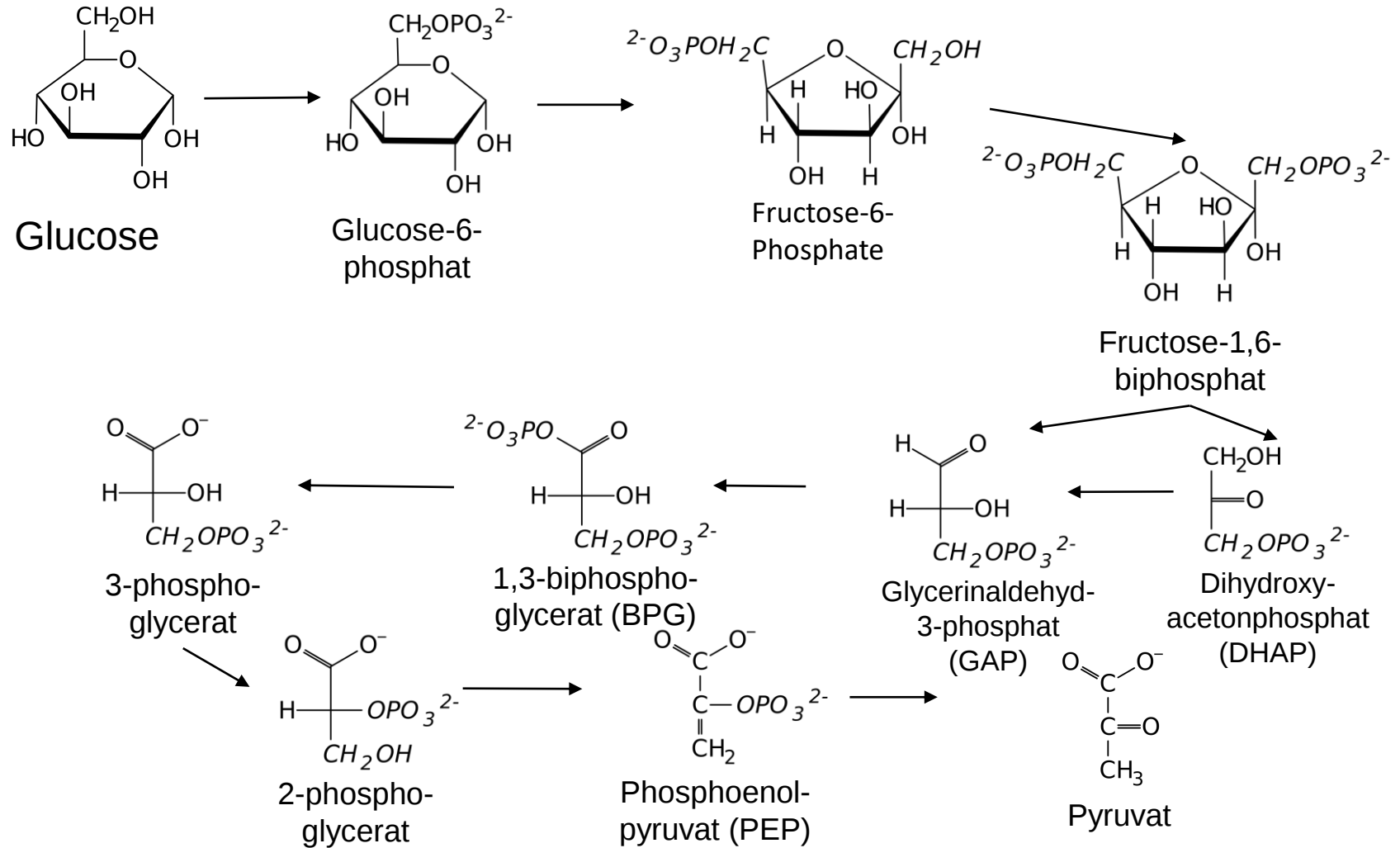
Yeast ferments
glucose to ethanol



Glycolysis

- metabolic pathway; converts glucose to pyruvate; necessary for the production of ATP
- in the cytoplasm
- Presence (aerobic) or absence (anaerobic) of oxygen

Glycolysis



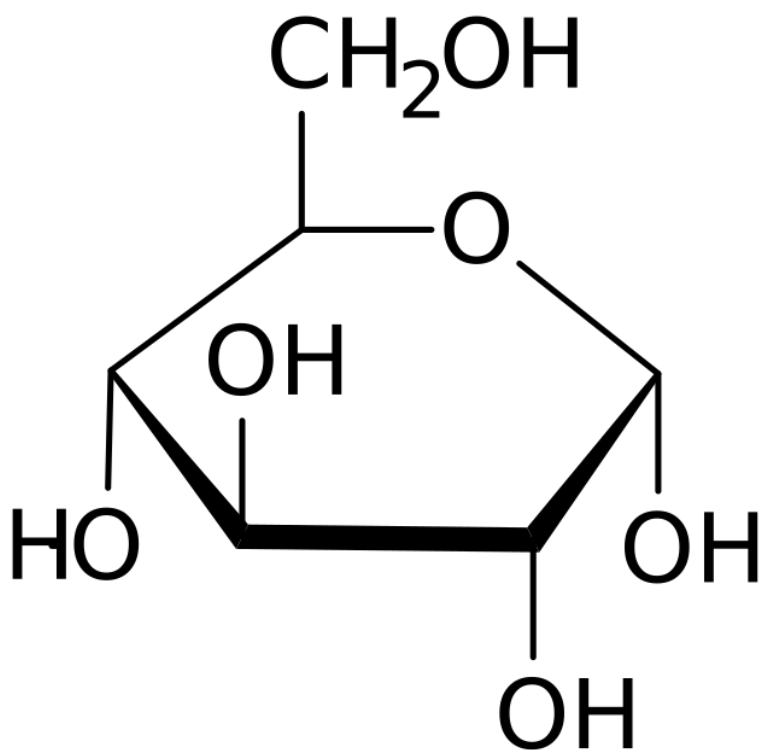
Alcoholic fermentation

- biotechnological process accomplished by yeast/bacteria/other microorganisms
- convert sugars into ethyl alcohol and carbon dioxide.
- $$\text{C}_6\text{H}_{12}\text{O}_6 + 2\text{ADP} + 1\text{P}_i \xrightarrow{\text{Yeast enzymes}} 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2 + 2\text{ATP}$$
- Glycolysis → Decarboxylation → NADH regeneration

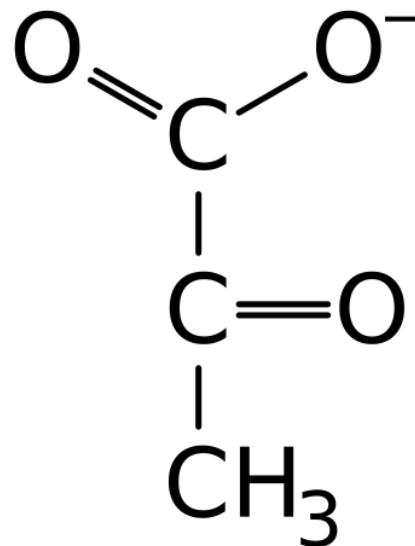
alcoholic fermentation

Glycolysis

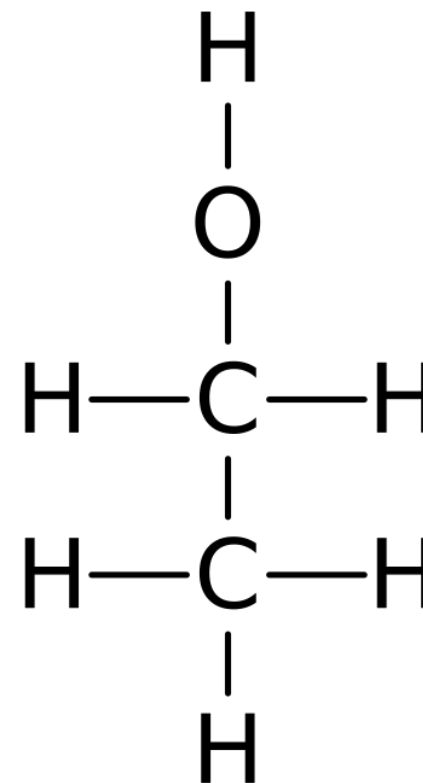
Fermentation



Glucose



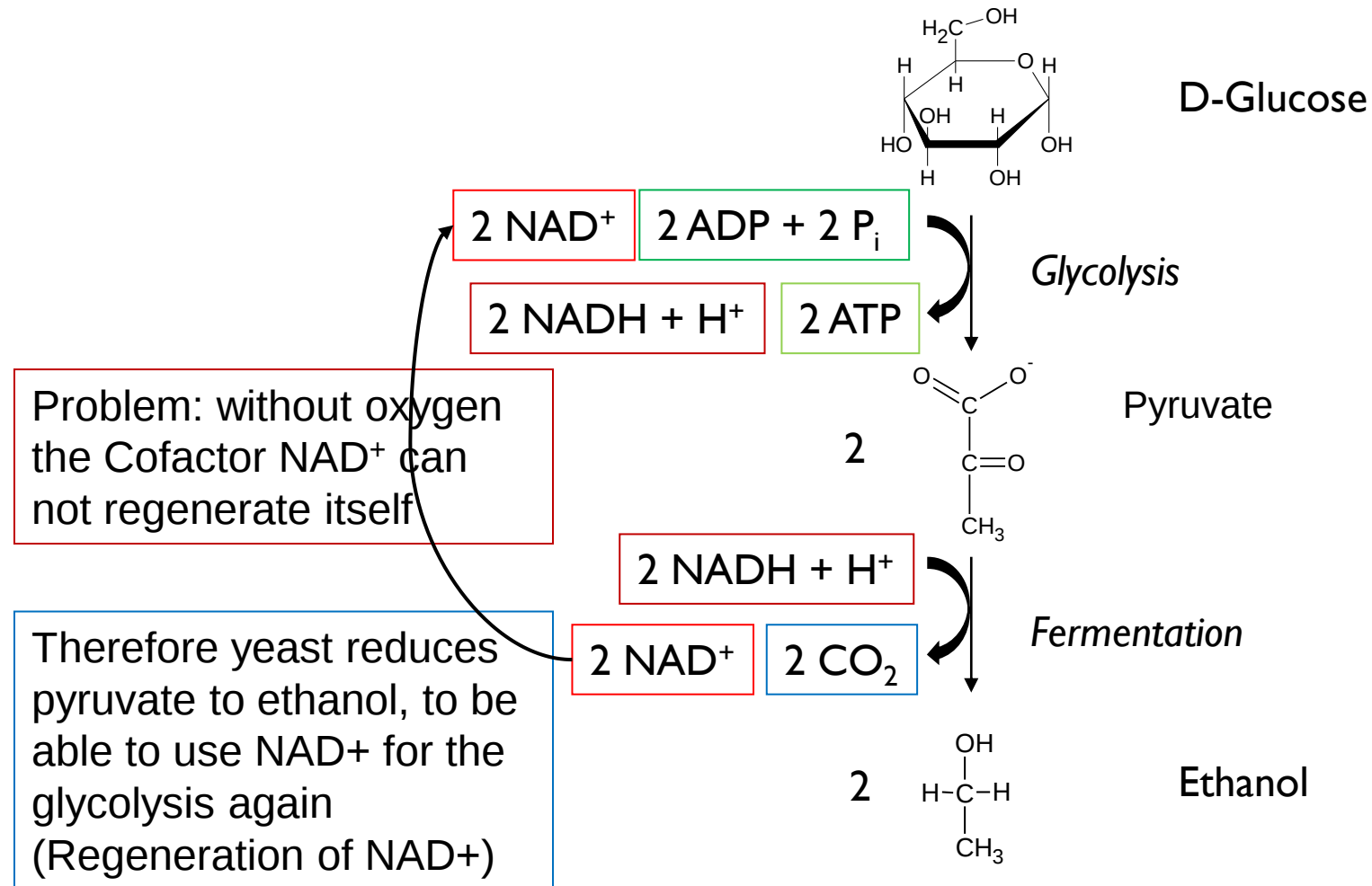
Pyruvat



Ethanol

Fermentation

- *Saccharomyces cerevisiae* can grow under **aerobic** as well as under **anaerobic conditions**



Yeast - other use for yeast

- Alcoholic drinks, bread, non-alcoholic drinks (taste), science (human genetics), biofuel, probiotics, protein source, parmesan replacement
- Some special forms of yeast: For example wine production
 - Fresh yeast
 - Instant yeast
 - Active (dry) yeast
 -
- Wine production: optimized yeast, more predictable

Sources

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