

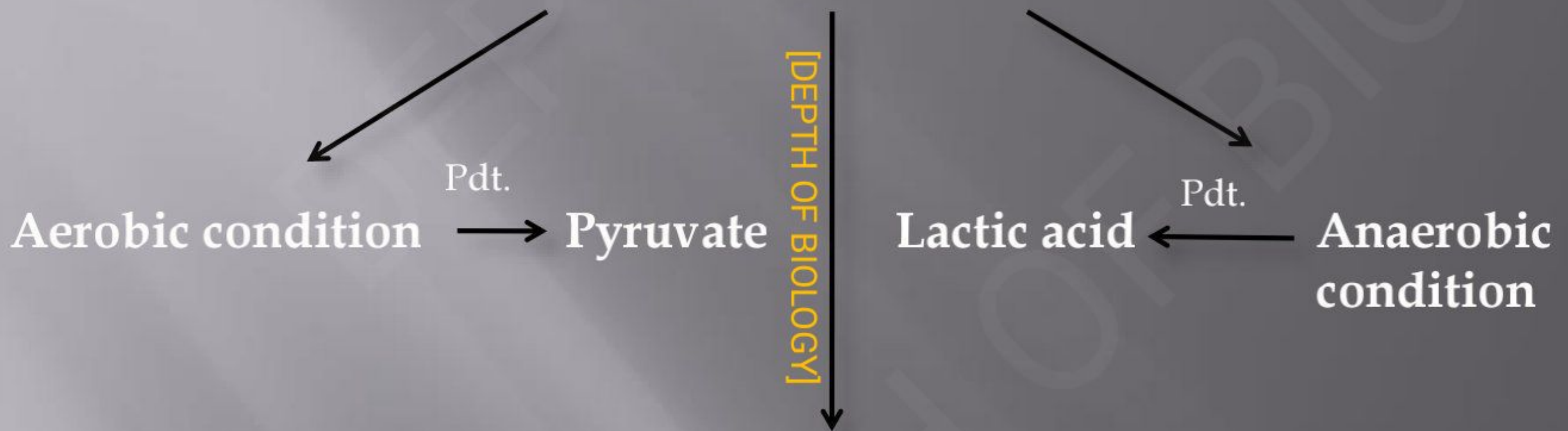
GLYCOLYSIS

(EMP)

[DEPTH OF BIOLOGY]

GLYCOLYSIS

[DEPTH OF BIOLOGY]



Some free energy is conserved
In form of ATP & NADH

- ❖ Glycolysis is found in cytoplasm/ cytosol of all cells.
- ❖ Glycolysis is major pathway for utilisation of glucose. [DEPTH OF BIOLOGY]
- ❖ Glycolysis important for those cells which do not have mitochondria because this process forms ATP.
ex. Erythrocytes/ RBC
- ❖ Essential for brain (glucose) or for proper functioning of brain.
- ❖ Intermediate are used for synthesis of fats and amino acid. [DEPTH OF BIOLOGY]

GLUCOSE

GLYCOLYSIS

[DEPTH OF BIOLOGY]

BREAKAGE

α - D- Glucose [6C]

ATP  Phosphorylation
ADP 

Glucose-6-Phosphate [6C]

Isomerisation

Fructose-6-Phosphate [6C]

ATP  Phosphorylation
ADP 

Fructose-1,6-Diphosphate [6C]

Cleavage

(3C) PGAL $\rightleftharpoons$ DHAP [3C]

NAD⁺  [DEPTH OF BIOLOGY]
H⁺ + NADH 

2 X 1,3- di PGA [3]

ADP + ip  Dephosphorylation
2 ATP 

2 X 3 PGA [3C]

Shifting of phosphate

2 X 2 PGA

[DEPTH OF BIOLOGY] Hydration

2 X PEPA (PhosphoenolPyruvate)

ADP + ip  Dephosphorylation
2 ATP 

2 X Pyruvic Acid (CH₃COCOOH)

Enzymes Involved in Glycolysis

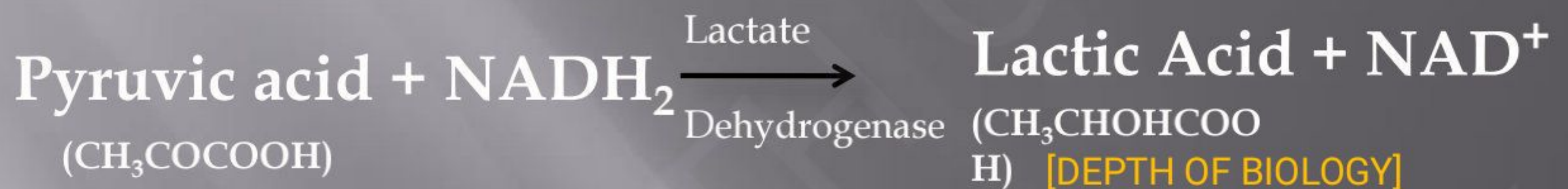
[DEPTH OF BIOLOGY]

1. Hexokinase
2. Phosphogluco Isomerase
3. Phosphofructokinase
4. Aldolase [DEPTH OF BIOLOGY]
5. Phosphotrio Isomerase
6. Phosphogluco Dehydrogenase / Phosphoglucoaldehyde Hydrogenase
7. Phosphoglycero Kinase
8. Phosphoglycero Mutase
9. Emolase [DEPTH OF BIOLOGY]
10. Pyruvate Kinase

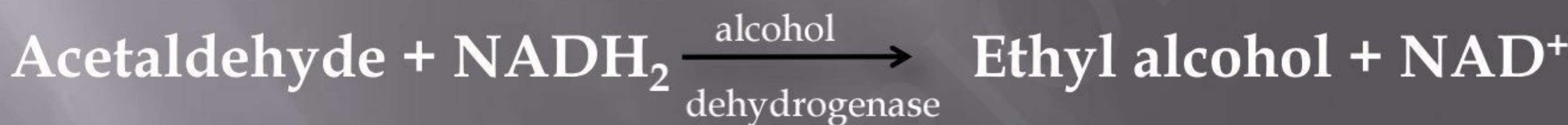
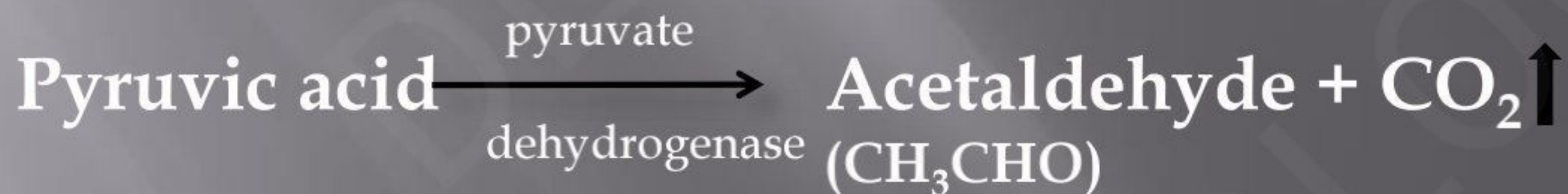
Anaerobic Pathway/ Fermentation

(Energy Loss)

1. Lactic Acid Anaerobic respiration



2. Alcoholic Anaerobic Fermentation



In Glycolysis aerobic pathway $\xrightarrow{\quad}$ Formation 10 – utilised 2 ATP
[DEPTH OF BIOLOGY] $\searrow$ 8 ATP formed [DEPTH OF BIOLOGY]

Phases of Glycolysis

1. Energy Investment Phase

[DEPTH OF BIOLOGY]

2. Energy Splitting Phase

3. Energy Generation Phase

[DEPTH OF BIOLOGY]

ENERGETICS

Glycerol 3- Phosphate dehydrogenase $\longrightarrow$ 6
(2 NADH, ETC, Oxidation phosphorylation)
[DEPTH OF BIOLOGY]

Phosphoglycerate Kinase (SLP) $\longrightarrow$ 2

Pyruvate Kinase (SLP) $\longrightarrow$ 2
[DEPTH OF BIOLOGY]

Two ATP consumed reaction catalysed by $\longrightarrow$ -2
Hexokinase & phosphofructo kinase

Net ATP Synthesis in Glycolysis aerobic condition $\longrightarrow$ 8
[DEPTH OF BIOLOGY]

Significance of Glycolysis

[DEPTH OF BIOLOGY]

- Energy obtain in form of ATP which is used further for various metabolic process.
- Acetyl Co – A is essential for biosynthesis of cholesterol.
- Glycolysis is the first step of the complete oxidation of glucose. [DEPTH OF BIOLOGY]
- RBC does not contain mitochondria . So, in RBC ATP Production takes place by glycolysis.
- Pyruvate (end product of glycolysis) is used in biosynthesis of amino acid. [DEPTH OF BIOLOGY]