Repaso de Biología Parte I (Examen II)

Chareline Gutiérrez Marrero 801-14-2976

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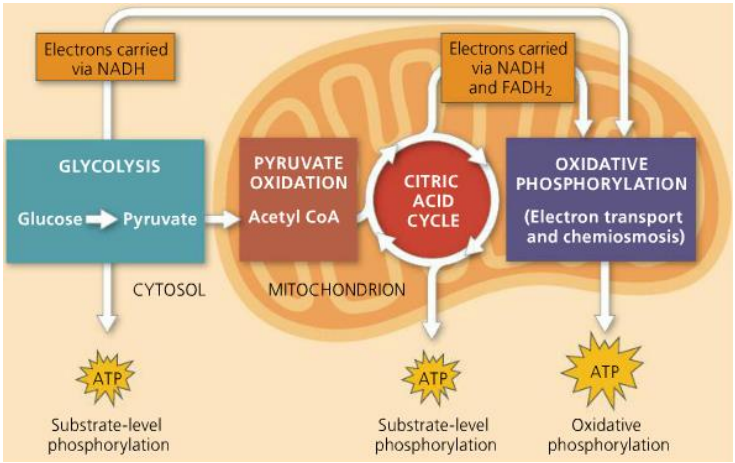
I. Cellular Respiration and Fermentation:

- Cellular respiration is composed of metabolic pathways that release stored energy by breaking down complex molecules called catabolic pathways. Through the activity of enzymes, a cell systematically degrades complex organic molecules that are rich in potential energy to simpler waste products that have less energy. These catabolic pathways can be divided by:
  - **Fermentation:** Partial degradation of sugars or other organic fuels that occur without the use of oxygen.
  - **Aerobic Respiration:** Oxygen is consumed as a reactant along with the organic fuel.

$$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O$$

- Organic compounds possess potential energy stored from the arrangement of electrons in the bonds between their atoms.
- Compounds that can participate in exergonic reactions can act as fuel. The breakdown of glucose is exergonic having free energy of change of ΔG= -686 kcal per mole of glucose decomposed

A. Stages of Cellular Respiration



1. **Substrate-level phosphorylation:** Mode of ATP synthesis occurs when an enzyme transfers a phosphate group from a substrate molecule to ADP.
   - ✓ **Glycolysis:** Occurs in the cytosol, begins the degradation process by breaking glucose into two smaller compounds called pyruvate. Oxidize glucose (six carbon) to pyruvate (three carbon)