

Answer on Question #57050 – Biology - Biochemistry

Question:

Summarize Glycolysis, Krebs Cycle, and Electron Transport give location, the process and the end products

Answer:

	<i>Location</i>	<i>Process</i>	<i>End products</i>
Glycolysis	Cytosol	13 reactions of step-by-step reduction of glucose. Three of these reactions (catalyzed by the <i>hexokinase</i> , <i>phosphofruktokinase</i> , and <i>pyruvate kinase</i>) are irreversible.	1 glucose molecule is converted into 2x Pyruvate . Released energy is stored in form of 2x ATP and 2x NADH molecules.
Krebs Cycle	Mitochondrial matrix	The cycle begins with synthesis of citrate from oxaloacetate and acetyl-CoA. Then, after a series of reactions, citrate loses 2 of its carbon atoms, and oxaloacetate is formed again. In general, with the help of Krebs cycle, acetyl-Coa (a wide-spread intermediate) is totally degraded.	1 acetyl-CoA is degraded to 2xCO₂ . Released energy is stored in the form of 1xGTP , 3xNADH and 1xFAD·H₂ (<i>although FAD·H₂ is quickly oxidized with reduction of ubiquinone - Q→Q·H₂</i>).
Electron Transport	Inner mitochondrial membrane	High-energy electrons from NADH and FAD·H ₂ are transported with the help of the four multiprotein complexes (<i>NADH dehydrogenase</i> , <i>succinate dehydrogenase</i> , <i>cytochrome c reductase</i> and <i>cytochrome oxidase</i>) to the oxygen. Released energy is used for pumping protons out of the matrix to the intermediate space of mitochondrion. This results in the formation of proton gradient, which is used by ATP-synthase forming ATP).	Molecular oxygen is reduced to water: O₂+4H⁺+4e⁻ → 2H₂O. ATP synthase uses proton gradient (result of electron transport) to synthesize ATP: ADP + P_i → ATP