

## Chapter 9 Respiration: Practice Multiple Choice Questions

- Glycolysis is believed to be one of the most ancient of metabolic processes. Which statement **LEAST** supports this idea?
  - If run in reverse, glycolysis will build glucose molecules.
  - Glycolysis neither uses nor needs free O<sub>2</sub>, which was in short supply during the early earth.
  - Glycolysis is found in all eukaryotic cells.
  - The enzymes of glycolysis are found in the cytosol rather than in a membrane-bound organelle.
  - Bacteria, the most primitive of cells, make extensive use of glycolysis.
- Which process in eukaryotic cells will normally proceed whether O<sub>2</sub> is present or absent?
  - aerobic respiration
  - glycolysis
  - Krebs cycle
  - oxidative phosphorylation
  - electron transport
- The primary function of the mitochondrion is the production of ATP. To carry out this function, the mitochondrion must have all of the following **EXCEPT**
  - the membrane-bound electron transport chain.
  - proton pumps embedded in the inner membrane.
  - enzymes for glycolysis.
  - enzymes from the Krebs cycle.
  - mitochondrial ATP synthase.
- In chemiosmotic phosphorylation of respiration (and photosynthesis), what is the most direct source of energy that is used to convert ADP + Pi to ATP?
  - electron transport system
  - Energy released from substrate-level phosphorylation
  - Energy released from ATP synthase pumping hydrogens ions against their concentration gradient
  - Energy released from diffusion of protons through ATP synthase
  - No external source of energy is required since the reaction is exergonic
- Each time a molecule of glucose is completely respired, how many oxygen (O<sub>2</sub>) molecules are required?
  - 1
  - 2
  - 3
  - 6
  - 12
- Fermentation is not as energy productive as aerobic respiration because
  - it does not take place in a specialized membrane-bound organelle
  - ethyl alcohol is more oxidized than CO<sub>2</sub>
  - it takes place within the mitochondria of cells
  - it is the pathway common to fermentation and respiration
  - NAD<sup>+</sup> is regenerated by alcohol or lactate production, without the high energy electrons passing through the electron transport chain.
- Inside an active mitochondrion, **most** electrons follow which pathway?
  - glycolysis --> NADH --> ATP --> oxygen
  - Krebs cycle --> FADH<sub>2</sub> --> electron transport chain
  - electron transport chain --> Krebs cycle --> ATP
  - pyruvate --> Krebs cycle --> ATP --> NADH --> oxygen
  - Krebs cycle --> NADH --> electron transport chain --> oxygen
- Muscle cells without enough oxygen convert pyruvate to \_\_\_\_\_ and in this step gain back \_\_\_\_\_.
  - lactic acid; ATP
  - alcohol; CO<sub>2</sub>
  - alcohol; ATP
  - ATP; NAD<sup>+</sup>
  - lactic acid; NAD<sup>+</sup>
- Assume you have landed on another planet with an atmosphere that is 50% oxygen, 20% carbon dioxide and 30% nitrogen. Atmospheric pressure on the planet is 1000 mm Hg. What is the partial pressure of oxygen on the planet in mm Hg?
  - 0.5
  - 20
  - 50
  - 160
  - 500
- When electrons move closer to a more electronegative atom,
  - energy is released.
  - energy is consumed.
  - a proton gradient is established.
  - water is produced.
  - ATP is synthesized.
- The final electron acceptor of the electron transport chain of oxidative phosphorylation (aerobic respiration) is
  - Oxygen
  - Water
  - NAD<sup>+</sup>
  - Pyruvate
  - ADP