

Practice Questions Relevant to Lectures 24/25 for Exam 3

Answer key on next page

Lectures 24+25 – REDUCTION-OXIDATION/RESPIRATORY CHAIN+OXIDATIVE PHOSPHORYLATION

1. Components of complex III of the electron transport chain have a more positive reduction potential (E_0) than:
 - A. reduced cytochrome C.
 - B. Coenzyme A.
 - C. cytochrome oxidase.
 - D. NADH.
2. Respiratory control in the mitochondria is ultimately determined by the availability of:
 - A. aspartate.
 - B. AMP.
 - C. ADP.
 - D. phosphate.
 - E. protons.
3. A logical reason why the mitochondrial adenine nucleotide transporter must operate in only one direction is:
4. What is complex IV of the electron transport (respiratory) chain also called?
5. The component of the ATP synthase complex that controls proton flow is:
6. Does uncoupling increase or decrease the rate of the electron transport chain? Explain your answer
7. Does uncoupling increase or decrease the rate of mitochondrial ATP synthesis? Explain your answer
8. The two types of gradients that are created by the electron transport (respiratory) chain are:
 - 1)
 - 2)
9. Define electrogenic transport.
10. Complex III of the electron transport (respiratory) chain is also called:
11. The component that links Complexes I and III of the electron transport (respiratory) chain is:
12. TRUE or FALSE Succinate-Q reductase of the respiratory chain produces enough energy to pump protons out of the mitochondrial matrix.
13. TRUE or FALSE The malate-aspartate shuttle oxidizes NADH that is produced by the lactate dehydrogenase reaction leading to the production of two ATP for each molecule of lactate that is oxidized.

ANSWER KEY

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1. D
2. C
3. To ensure that ATP is transported only out to the cytoplasm where it is needed for energy-requiring processes
4. Cytochrome Oxidase
5. The Stalk
6. INCREASE- During uncoupling the pH gradient is constantly dissipated. Hence the respiratory chain senses no pH gradient and operates at maximum rate in a fruitless attempt to sustain a gradient
7. DECREASE- With the pH gradient collapsed there is no driving force for ATP synthesis.
8. Proton (pH) AND Charge Gradients
9. Transport involving the net movement of charge across the membrane
10. Cytochrome Reductase
11. Coenzyme Q
12. False
13. False