

Faculty Of Medicine
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Chapter

Respiratory Module- MCQs
Final



Krebs' Cycle

- 1- **One of the following is Substrate level phosphorylation reaction in Krebs Cycle**
 - a) Phosphofructokinase-1
 - b) Glucokinase
 - c) Succinate thiokinase
 - d) Pyruvate Kinase
 - e) Phosphoglycerate kinase
- 2- **Which of the following intermediate of Krebs Cycle is use in Fatty acid Synthesis**
 - a) Citrate
 - b) Oxaloacetate
 - c) Succinyl-CoA
 - d) α -ketoglutarate
 - e) Malate
- 3- **Which of the following intermediate of Krebs Cycle is use in Glutamic acid Synthesis**
 - a) Citrate
 - b) Oxaloacetate
 - c) Succinyl-CoA
 - d) α -ketoglutarate
 - e) Malate
- 4- **Which of the following intermediate of Krebs Cycle is use in Aspartic acid Synthesis**
 - a) Citrate
 - b) Oxaloacetate
 - c) Succinyl-CoA
 - d) A-ketoglutarate
 - e) Malate
- 6- **Which of the following intermediate of Krebs Cycle is use in Heme Synthesis**
 - a) Citrate
 - b) Oxaloacetate
 - c) Succinyl-CoA
 - d) A-ketoglutarate
 - e) Malate
- 7- **Which of the following intermediate of Krebs Cycle is use in Gluconeogenesis**
 - a) Citrate
 - b) Oxaloacetate
 - c) Succinyl-CoA
 - d) A-ketoglutarate
 - e) Malate

- 8- Complete oxidation of one acetyl CoA via Krebs Cycle yields**
- a) 12 ATP
 - b) 8 ATP
 - c) 24 ATP
 - d) 38 ATP
 - e) 2 ATP
- 9- The energy yield of complete oxidation of two mole of acetyl CoA through Krebs' cycle is:**
- a) 12 ATP
 - b) 8 ATP
 - c) 24 ATP
 - d) 38 ATP
 - e) 2 ATP
- 10- Complete aerobic oxidation of one mole glucose in the liver yields:**
- a) 8 ATP
 - b) 38 ATP
 - c) 32 ATP
 - d) 2 ATP
- 11- Krebs' cycle products are all of the followings except:**
- a) GTP
 - b) ADP
 - c) FADH_2
 - d) CO_2
 - e) NADH
- 12- The citric acid cycle doesn't provide energy for:**
- a) The liver
 - b) The RBCs
 - c) The brain
 - d) Muscle.
- 13- In a eukaryotic cell, most of the enzymes of the citric acid cycle are located in the:**
- a) Cytoplasm.
 - b) Outer mitochondrial membrane.
 - c) Inner mitochondrial membrane.
 - d) Mitochondrial matrix.
- 14- Oxidative decarboxylation.**
- a) do not occur in the TCA cycle
 - b) involve loss of CO_2 and the production of NAD.
 - c) involve loss of CO_2 and the production of NADH.
 - d) involve loss of CO_2 and the production of FADH_2

15- ATP is produced directly in which of the reaction of the Krebs's cycle?

- a) Fumarate to malate.
- b) Isocitrate to oxaloacetate
- c) Succinyl CoA to Succinate.
- d) Succinate to fumarate.

16- In TCA cycle, Acetyl CoA oxidation produces

- a) 3 CO₂
- b) 2 NADH
- c) 2 ATP
- d) 2 FADH₂
- e) 1 GTP.

17- Citrate synthase is activated by

- a) Succinyl CoA
- b) NADH
- c) Fatty Acyl CoA
- d) Calcium

18- Which of the following is not the irreversible reaction of Kreb's cycle?

- a) Isocitrate dehydrogenase
- b) Alpha-ketoglutarate dehydrogenase
- c) Citrate synthase
- d) Malate dehydrogenase

19- Smoking cause inhibition of alpha-1 anti-trypsin by oxidation of

- a) Serine
- b) Cysteine
- c) Methionine
- d) Phenylalanine

20- Cystic fibrosis is due to deletion of three nucleotides of

- a) Serine
- b) Cysteine
- c) Methionine
- d) phenylalanine

21- Which of the following enzymes catalyzes an anaplerotic reaction?

- a) Malate dehydrogenase
- b) Pyruvate carboxylase
- c) Pyruvate kinase
- d) Citrate synthase

22- Malonate is a competitive inhibitor of•

- a) Citrate synthase
- b) Aconitase
- c) Succinate dehydrogenase
- d) Malate dehydrogenase.

23- Which of the following vitamins is required for the synthesis of a cofactor required for the conversion of Succinate to Fumarate?

- a) Thiamine
- b) lipoic acid
- c) Pantothenic acid
- d) Niacin
- e) Riboflavin.

24- Oxidation of which of the following substrates in the citric acid cycle is not coupled to the production of NADH?

- a) Succinate
- b) Malate
- c) α -Ketoglutarate
- d) isocitrate

25- The entry of Acetyl CoA into the TCA cycle is inhibited by the presence of a high cellular concentration of_____

- a) Pyruvate
- b) ATP
- c) ADP
- d) Coenzyme A

26- All the following vitamins used as coenzymes in Krebs Cycle except

- a) Niacin
- b) Thiamine
- c) Biotin
- d) Riboflavin
- e) Pantothenic acid

27- Which of the following enzymes present in inner mitochondrial membrane

- a) Malate dehydrogenase
- b) Succinate thiokinase
- c) Succinate dehydrogenase
- d) Isocitrate dehydrogenase

28- Which of the following steps produce FADH₂

- a) Malate dehydrogenase
- b) Succinate thiokinase
- c) Succinate dehydrogenase
- d) Isocitrate dehydrogenase.

Respiratory Chain

- 1- _____ are enzymes concerned with removal of hydrogen using O₂ as acceptor
 - a) Oxygenase
 - b) Dehydrogenase
 - c) Hydroperoxidase
 - d) Oxidases
- 2- _____ are responsible for disposal of hydrogen peroxides H₂O₂ from the body.
 - a) Oxygenase
 - b) Dehydrogenase
 - c) Hydroperoxidase
 - d) Oxidases
- 3- _____ Transfer hydrogen from one substrate to another, in a reversible, coupled oxidation-reduction reaction.
 - a) Oxygenase
 - b) Dehydrogenase
 - c) Hydroperoxidase
 - d) Oxidases
- 4- _____ catalyze incorporation of oxygen into substrate molecules, with the synthesis or degradation of different metabolites.
 - a) Oxygenase
 - b) Dehydrogenase
 - c) Hydroperoxidase
 - d) Oxidases
- 5- Microsomal cytochrome P450 is an example of _____.
 - a) Mono-Oxygenase
 - b) Dehydrogenase
 - c) Hydroperoxidase
 - d) Oxidases
- 6- The synthesis of ATP in the respiratory chain is formed by :
 - a) complex I
 - b) complex II
 - c) complex III
 - d) complex IV
 - e) complex V
- 7- All the following members of respiratory Chain are proteins except
 - a) Cytochrome C Oxidase
 - b) Cytochrome b-c1
 - c) Succinate dehydrogenase
 - d) ATP synthase
 - e) Ubiquinone

8- Which of the following enzymes need copper as a cofactor

- a) Cytochrome C Oxidase
- b) Cytochrome b-c1
- c) Succinate dehydrogenase
- d) ATP synthase

9- Iron-sulfur center present in all the following complexes except

- a) Cytochrome C Oxidase
- b) Cytochrome b-c1
- c) Succinate dehydrogenase
- d) NADH Dehydrogenase

10- Which of the following is the only irreversible reaction

- a) Cytochrome C Oxidase
- b) Cytochrome b-c1
- c) Succinate dehydrogenase
- d) NADH Dehydrogenase.

11- Which of the following is the only mobile cytochrome

- a) Cytochrome a
- b) Cytochrome b
- c) Cytochrome c
- d) Cytochrome d

12- Which of the following complexes of ETC does not account for the pumping out of protons from the mitochondrial matrix?

- a) Complex I
- b) Complex II
- c) Complex III
- d) Complex IV

13- How many ATP mole will be formed per oxygen atoms consumed If you start with NADH₂?

- a) 1
- b) 2
- c) 3
- d) 4

14- Which of the following is the prosthetic group of NADH dehydrogenase?

- a) FAD
- b) FMN
- c) NADH
- d) NADPH

- 15- Which of the following is the correct sequence of electron acceptors in ETS for production of ATP?**
- a) Cyt. b, c, a, a₃
 - b) Cyt. a, a, b, c
 - c) Cyt. c, b, a, a₃
 - d) Cyt. c, b, a₃, a
- 16- Which of the following terminal cytochromes is responsible for donating electrons to oxygen?**
- a) Cyt. b
 - b) Cyt. a
 - c) Cyt. c
 - d) Cyt. a₃
- 17- Which of the following is the Complex II of ETC?**
- a) NADH dehydrogenase
 - b) Succinate dehydrogenase
 - c) Cytochrome bc₁
 - d) ATP synthase
- 18- Which of the following is the entry site for FADH₂ in ETC?**
- a) NADH dehydrogenase
 - b) Succinate dehydrogenase
 - c) Cytochrome bc₁
 - d) ATP synthase
- 19- Which of the following products of glucose oxidation are necessary for oxidative phosphorylation?**
- a) Pyruvate
 - b) NADH and FADH₂
 - c) Acetyl CoA
 - d) NADPH and FADH₂
- 20- Which of the following is true for cytochrome c oxidase complex?**
- a) It donates electrons to O₂
 - b) It accepts electrons from Cyt c
 - c) It pumps two protons out of the mitochondrial matrix
 - d) All of the above
- 21- The rate of respiration of mitochondria can be controlled by the availability of:**
- a) ADP
 - b) ATP
 - c) FMN
 - d) FAD
 - e) NAD⁺

- 22- If the mitochondria were blocked at the site of NADH oxidation and were treated with succinate as substrate, what would the P: O ratio is?**
- a) Zero
 - b) One less than normally produced by succinate
 - c) Same as that normally produced by succinate
 - d) One more than normally produced by succinate
 - e) Higher than normal because of the excessive heat produced from uncoupling.
- 23- If the oxidative phosphorylation was uncoupled in the mitochondria, what would one expect?**
- a) A decreased concentration of ADP in the mitochondria
 - b) Increased inorganic phosphate in the mitochondria
 - c) A decreased oxidative rate
 - d) A decreased production of heat
 - e) Increased transport of ADP from the cytosol to the mitochondrial matrix
- 24- If the rotenone is added to the mitochondrial electron transport chain:**
- a) P: O ratio of NADH is reduced from 3:1 to 2:1
 - b) Rate of NADH oxidation is diminished to two- thirds of its initial value
 - c) Succinate oxidation remains normal
 - d) Oxidative phosphorylation is uncoupled at the site I
 - e) Electron flow is inhibited at site II
- 25- If 2,4 dinitrophenol is added to tightly coupled mitochondria that are actively oxidizing succinate**
- a) Electron flow will continue but ATP synthesis will not occur
 - b) Electron flow will continue but ATP synthesis will be increased
 - c) Electron flow will cease, but ATP synthesis will continue
 - d) Both Electron flow and ATP synthesis will be ceased
 - e) Subsequent addition of Oligomycin will cause ATP hydrolysis
- 26- The effect of uncouplers on oxidative phosphorylation involves all of the following except:**
- a) The net yield of ATP decreases
 - b) Rate of oxygen consumption increases
 - c) Excessive heat is released
 - d) The oxidation process in the chain will be stopped
 - e) The rate of flow of electrons increases.

a) Coenzyme Q
b) Cytochrome b
c) FAD
d) FMN
e) NAD

- O₂
- Ubiquinone
- NADH
- FMN
- Cytochrome C

- NAD
- Flavoprotein
- Iron Sulfur
- Ubiquinone

- a) Rotenone
- b) Carbon monoxide
- c) Malonate
- d) Antimycin A
- e) Oligomycin

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Phospholipid Metabolism

1. **What are the two main types of phospholipids?**
 - A) Glycerophospholipids
 - B) Sphingomyelin
 - C) Both A and B
 - D) Cholesterol
2. **Which fatty acid is typically attached to carbon 1 of glycerol in glycerophospholipids?**
 - A) Unsaturated fatty acid
 - B) Saturated fatty acid
 - C) Both saturated and unsaturated fatty acids
 - D) Trans fatty acid
3. **What is the parent molecule for the synthesis of glycerophospholipids?**
 - A) phosphatidyl choline
 - B) Phosphatidic acid
 - C) phosphatidyl inositol
 - D) phosphatidyl cardiolipin
4. **In the first pathway of glycerophospholipid synthesis to add a head group, phosphatidic acid is cleaved to form:**
 - A) Glycerol
 - B) Diacylglycerol (DAG)
 - C) CDP-diacylglycerol
 - D) Phosphatidylcholine
5. **What is the role of phospholipase A2 in phospholipid metabolism?**
 - A) Cleaves fatty acyl group on carbon 1
 - B) Cleaves fatty acyl group on carbon 2
 - C) Cleaves bond between phosphate and head group
 - D) Synthesizes phosphatidic acid
6. **What condition can result from insufficient production of lung surfactant in premature infants?**
 - A) Emphysema
 - B) Respiratory distress syndrome (RDS)
 - C) Asthma
 - D) Cystic fibrosis
7. **Which phospholipase is inhibited by glucocorticoids like cortisol?**
 - A) Phospholipase A1
 - B) Phospholipase A2
 - C) Phospholipase C
 - D) Phospholipase D

- A) Formation of phosphatidic acid
- B) Production of DAG and inositol trisphosphate (IP3)
- C) Release of arachidonic acid
- D) Synthesis of phosphatidylcholine

- A) A mitochondrial disease that increase phospholipids
- B) A lysosomal storage disorder characterized by excess phospholipids
- C) A metabolic syndrome
- D) decrease phosphatidyl choline

- A) Indicates fetal weight
- B) Indicates lung maturity
- C) Indicates genetic disorders
- D) Indicates placental health

- A) Saturated fatty acid
- B) Unsaturated fatty acid
- C) Both saturated and unsaturated fatty acids
- D) Polyunsaturated fatty acid

- A) Acts as a substrate for phospholipases
- B) Donates methyl groups for methylation reactions
- C) Inhibits phospholipid synthesis
- D) Activates phospholipases
- D) It is phosphorylated to form PIP2

- A) Phospholipase A1
- B) Phospholipase D
- C) Phospholipase C
- D) Phospholipase A2

- A) Genetic mutations
- B) Drug interactions that inhibit phospholipid hydrolysis
- C) Nutritional deficiencies
- D) Viral infections

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