<Q>The complete reduction of one molecule of oxygen requires how many electrons?

<S>Y

<C>one

<C>two

<C+>four

<C>eight

<Q>Complex IV of the electron transport chain oxidizes _____, reduces _____, and _____ protons in the process.

<S>Y

<C>coenzyme Q,cytochrome c,pumps

<C>cytochrome c,coenzyme Q,pumps

<C>cytochrome c,O2,does not pump

<C+>cytochrome c,O2,pumps

<Q>Which of the following is not a part of the electron transport chain?

<S>Y

<C>NADH

<C>FADH2

<C>coenzyme Q

<C+>coenzyme A

<Q>The Q cycle refers to flow of electrons from

<S>Y

<C>NADH to coenzyme Q via Complex I

<C>FADH2 to coenzyme Q via Complex II

<C+>coenzyme Q to cytochrome c via Complex III

<C>coenzyme Q to NADH

<Q>Which of the following components of the electron transport chain can only participate in one-electron transfer?

<S>Y

<C>NAD

<C>FAD

<C>Coenzyme Q

<C+>cytochrome C

<Q>What is the net yield of ATP per glucose-1-phosphate molecule that passes through all of aerobic respiration (glucose-1-phosphate –> CO2 + H2O)?

<S>Y

<C>2

<C>3

<C>32

<C+>33

<Q>Another name for Complex I in the mitochondria is:

<S>Y

<C>Cytochrome C oxidase.

<C+>NADH-CoQ oxidoreductase.

<C>succinate-CoQ reductase.

<C>Cytochrome A oxidase

<Q>Oxidative phosphorylation is coupled to electron transport in

<S>Y

<C>Complexes I, II, and III

<C>Complexes I, II, and IV

<C+>Complexes I, III, and IV

<C>all four respiratory complexes

<Q>Chemiosmotic coupling involves the process of:

<S>Y

<C>using an electron gradient to synthesize ATP.

<C+>using a proton gradient to synthesize ATP.

<C>using oxygen flow to synthesize ATP.

<C>using a proton gradient to make water from oxygen

<Q>Which of the following is not true of the process of oxidative phosphorylation?

<S>Y

<C>protons flow into the mitochondrial matrix through ion channels in the ATP synthase

<C>the F0 part of the ATP synthase serves as a proton channel

<C>the F1 part of the ATP synthase is the site of ATP formation

<C+>antimycin A uncouples this process

<Q>The following respiratory inhibitors all block the final step of electron transport, the reduction of oxygen to form water, except:

<S>Y

<C>Azide

<C>Cyanide

<C>Carbon Monoxide

<C+>Rotenone

<Q>The final electron acceptor in complex I is:

<S>Y

<C>oxygen

<C+>coenzyme Q

<C>FMN

<C>cytochrome b

<Q>Proton pumping takes place in all of the following complexes, except:

<S>Y

<C>Complex I.

<C+>Complex II.

<C>Complex III.

<C>Complex IV.

<Q>Reduction of oxygen during oxidative phosphorylation occurs in

<S>Y

<C+>Matrix side of the inner mitochondrial membrane

<C>inter membrane space side of the inner mitochondrial membrane

<C>lipids bilayer of the inner mitochondrial membrane

<C>cytosol

<Q>Transfer of electrons between cytochrome a and cytochrome a3 at complex IV is mediated by

<S>Y

<C+>copper ion intermediate

<C>iron ion intermediate

<C>sulfur ion intermediate

<C>magnesium ion intermediate

<Q>Oxidation of three moles of NADH through the electron transport chain consumes:

<S>Y

<C>One mole of oxygen

<C>Half mole of oxygen

<C>2 moles of oxygen

<C+>1.5 moles of oxygen

<Q>Transfer of electrons from NADH to oxygen reQuires all of the respiratory complexes EXCEPT:

<S>Y

<C>complex I

<C+>complex II

<C>complex III

<C>complex IV

<Q>How many different peptide chains the F1 portion of ATP synthase has?

<S>Y

<C+>5

<C>6

<C>7

<C>8

<Q>Presence of high concentration of carbon monoxide in a cell causes:

<S>Y

<C+>Accumulation of Cyt aa3 in its reduced form

<C>Accumulation of Cyt aa3 in its oxidized form

<C>Accumulation of Cyt a in its reduced form

<C>Accumulation of Cyt a in its oxidized form

<Q>Which of the following is not a respiratory inhibitor?

<S>Y

<C>Antimycin A

<C>Rotenone

<C+>Valinomycin

<C>Amytal

<Q>Which of the following is NOT CORRECT regarding Complex I of electron transport chain?

<S>Y

<C>Catalyzes electron transfer from NADH to Coenzyme Q

<C>Contains iron-sulfur proteins and flavoproteins

<C+>CoQ is fixed at the complex

<C>Responsible for proton pumping

<Q>The correct statement about hemoglobin and cytochromes is

<S>Y

<C+>iron ion is bound to the heme group in both hemoglobin and cytochromes

<C>in both hemoglobin and cytochromes iron ion undergoes oxidation and reduction

<C>in hemoglobin iron ion is bound to the protein part while in cytochromes it is bound to heme group

<C>in cytochromes iron ion is bound to the protein part while in hemoglobin it is bound to heme group

<Q>Most of the reactions of the electron transport chain occur in the mitochondrial:

<S>Y

<C>outer membrane

<C+>inner membrane.

<C>matrix.

<C>intermembrane space.

<Q>The coupling factor which links oxidation and phosphorylation is:

<S>Y

<C+>ATP synthase

<C>cytosolic citrate lyase

<C>cytochrome oxidase

<C>pyruvate dehydrogenase

<Q>The final electron acceptor in the electron transport chain is:

<S>Y

<C+>oxygen

<C>ubiquinone

<C>cytochrome c

<C>nonheme iron protein

<Q>Which of the following compounds inhibits the phosphorylation of ADP without affecting electron transport?

<S>Y

<C>Antimycin A

<C>Amytal

<C>Rotenone

<C+>Gramicidin A

<Q>Which of the following respiratory complexes contains two copper ions in its structure that are involved in the electron transport process?

<S>Y

<C+>IV

<C>II

<C>III

<C>I

<Q>In the electron transport system, the only reaction which actually uses molecular oxygen is:

<S>Y

<C+>Cytochrome C oxidase.

<C>NADH-CoQ oxidoreductase.

<C>succinate-CoQ oxidoreductase.

<C>CoQH2-Cytochrome c oxidoreductase.

<Q>Most of the ATP made during cellular respiration is generated by:

<S>Y

<C>substrate-level phosphorylation.

<C+>oxidative phosphorylation.

<C>glycolysis.

<C>photophosphorylation.

<Q>Cyanide is poisonous because it:

<S>Y

<C>interferes with fatty acid transport.

<C>activates fatty acid desaturation.

<C>inhibits gluconeogenesis.

<C+>inhibits mitochondrial oxidation.

<Q>Mitochondrial ATP synthesis requires:

<S>N

<C> a [H+] gradient.

<C> a membrane potential.

<C> an intact inner mitochondrial membrane.

<C+>all of these are correct

<Q>Which of the following respiratory inhibitors will block the electron transfer involving cytochrome b, and coenzyme Q?

<S>Y

<C> Rotenone.

<C+>Antimycin A.

<C>Carbon monoxide.

<C> Amytal.

<Q>Most of the ATP made during cellular respiration is generated by:

<S>Y

<C> substrate-level phosphorylation.

<C+> oxidative phosphorylation.

<C> glycolysis.

<C> photophosphorylation.

<Q>The final electron acceptor of complex I is:

<S>Y

<C>oxygen

<C+>ubiquinone

<C>cytochrome c

<C>nonheme iron protein

<Q>In the respiratory electron transport chain electrons are passed from _____.

<S>Y

<C+>NADH and QH2 to O2

<C> O2 to NAD+ and Q

<C> O2 to NADH

<C> ATP to O2

<Q>Compare the pH of the mitochondrial matrix and the inner membrane space.

<S>Y

<C> The pH is lower in the matrix.

<C> The pH in both regions is the same.

<C+>The pH is lower in the intermembrane space.

<C> The comparison of pH varies from moment to moment depending on energy needs of the cell.

<Q>Which of the following is mismatched (not related to each other)?

<S>Y

<C> outer mitochondrial membrane - permeable to ions and water

<C> inner mitochondrial membrane - permeable to O2 and CO2

<C+>outer mitochondrial membrane - location of ATP synthase

<C> inner mitochondrial membrane - location of ATP synthase

<Q>For normal mitochondria in the presence of an oxidizable substrate and an uncoupler such as

2,4-dinitrophenol which do you expect?

<S>N

<C> oxygen consumption even in the absence of ADP

<C> a rise in temperature to dissipate energy that would otherwise have been used to generate ATP

<C> the flow of protons into the mitochondria matrix

<C+>All of the above

<Q>What is the role of FMN in complex I?

<S>Y

<C+>Converts a two-electron transfer to a one-electron transfer.

<C> Converts a one-electron transfer to a two-electron transfer.

<C> Transports four H+ across the membrane.

<C> None, there is no FMN in complex I.

<Q>Which is not a component of complex II?

<S>Y

<C> Fe-S protein

<C> FAD

<C+>heme

<C>cytochrome b

<Q>During the Q-cycle _____ molecule(s) of QH2 is(are) oxidized and _____ molecule(s) of

Q is(are) produced.

<S>Y

<C> 1; 1

<C> 1; 2

<C+>2; 1

<C> 2; 2

<Q>Which statement is false about complex IV?

<S>Y

<C> A binuclear center that contains an iron ion and heme-a3 is the site of the reduction of

molecular oxygen to water.

<C+>Bacterial and eukaryotic forms of complex IV have very similar structures and number of

subunits per functional unit.

<C> The core structure of the cytochrome c oxidase in complex IV has three conserved

subunits.

<C> Copper ions shift from a +2 oxidation state to a +1 oxidation state as electrons are passed

through the complex.