# Electron Transport Chain

*Practice Problems for MCB 2000*

# Question 1

Complexes I and II each transfer electrons to _____.

A) Membranes

B) Cytosol

C) Intermembrane space

D) $Zn^{2+}$

E) CoQ

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# Question 2

Which complex is unable to pump protons across the mitochondrial membrane?

A) Complex I

B) Complex II

C) Complex III

D) Complex IV

E) All the complexes are able to pump protons.

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# Question 3

Which of the following is true for cytochrome c oxidase complex?

A) It donates electrons to O2

B) It accepts electrons from Cytochrome c

C) It pumps two protons out of the mitochondrial matrix

D) All of the above

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# Question 4

Which of the following is NOT produced during the electron transport chain?

A) Carbon dioxide

B) Water

C) ATP

D) NAD+

E) FAD

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# Question 5

Which of the following steps of the electron transport chain directly drives ADP phosphorylation?

A) Proton flow through ATP synthase along a concentration gradient.

B) Proton pumped against the concentration gradient.

C) The oxidation of NADH + H+.

D) The oxidation of FADH2.

E) The formation of water molecules.

# Question 5

Which of the following steps of the electron transport chain directly drives ADP phosphorylation?

A) Proton flow through ATP synthase along a concentration gradient.

B) Proton pumped against the concentration gradient.

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E) The formation of water molecules.

# Question 6

Cyanide acts as a poison because it inhibits complex IV, making it unable to transport electrons. How would cyanide poisoning affect the electron transport chain and the proton gradient across the inner mitochondrial membrane?

A) The electron transport chain would speed up, and the gradient would become stronger

B) The electron transport chain would stop, and the gradient would decrease

C) Both the electron transport chain and the gradient would stay the same

D) The electron transport chain would be re-routed through complex II, and the gradient would become weaker

# Question 6

Cyanide acts as a poison because it inhibits complex IV, making it unable to transport electrons. How would cyanide poisoning affect the electron transport chain and the proton gradient across the inner mitochondrial membrane?

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C) Both the electron transport chain and the gradient would stay the same

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# Further Practice:

- https://www.khanacademy.org/science/revision-term-1-tg-botany-class-12/x4896182c249a2390:week-2/x4896182c249a2390:respiration/e/etc-and-oxidative-phosphorylation-1 (this page includes 4 different short sets of questions)
- https://www.andrew.cmu.edu/course/03-231/MCQF05/MCQLec30.htm
- https://quizlet.com/195104764/quiz-16-electron-transport-chain-flash-cards/
- https://apbio1516.weebly.com/uploads/5/8/5/6/58561837/cell_resp_with_key.pdf