

Cellular Respiration and Energy Production

Biology · Answer Key · 22 Questions

1. What is the primary purpose of cellular respiration?

- A) To produce carbon dioxide
- B) To break down glucose to release energy and produce ATP**
- C) To absorb oxygen
- D) To synthesize proteins

2. What does ATP stand for and why is it called the 'energy currency of the cell'?

- A) Adenosine Triphosphate; it is used to build cell walls
- B) Adenosine Tetrphosphate; it powers cell movement
- C) Adenosine Triphosphate; it provides usable energy for cellular activities**
- D) Amino Triphosphate; it stores genetic information

3. Which of the following is NOT listed as an activity supported by ATP?

- A) Muscle movement
- B) Active transport
- C) Photosynthesis**
- D) Cell division

4. What are the reactants in the general equation for aerobic respiration?

- A) Carbon dioxide and water
- B) Glucose and oxygen**
- C) ATP and oxygen
- D) Glucose and carbon dioxide

5. What are the products of aerobic respiration?

- A) Glucose and oxygen
- B) Carbon dioxide and water only
- C) Carbon dioxide, water, and ATP**
- D) ATP and oxygen

6. What does the term 'aerobic' mean in the context of respiration?

- A) Without oxygen
- B) With oxygen**
- C) In the cytoplasm
- D) Producing a small amount of ATP

7. Approximately how many usable ATP molecules are yielded per glucose molecule during aerobic respiration according to the text?

- A) 10-12
- B) 20-24
- C) 36-38**
- D) 50-60

8. What is the first major stage of aerobic respiration?

- A) Acetyl-CoA Formation
- B) Citric Acid Cycle
- C) Glycolysis**
- D) Chemiosmosis

9. Where does glycolysis occur in the cell?

- A) Mitochondrial matrix
- B) Inner mitochondrial membrane
- C) Cytoplasm**
- D) Outer mitochondrial membrane

10. What is the main event of glycolysis?

- A) Conversion of Acetyl-CoA to Citric Acid
- B) Breakdown of glucose into 2 pyruvate molecules**
- C) Transfer of electrons through proteins
- D) Production of a large amount of ATP

11. After glycolysis, pyruvate molecules enter the mitochondrion and are converted into:

- A) Glucose
- B) Lactate
- C) Acetyl-CoA**
- D) Ethanol

12. The Citric Acid Cycle is also known as the:

- A) Electron Transport System
- B) Krebs Cycle**
- C) Chemiosmosis
- D) Glycolysis

13. Where does the Citric Acid Cycle (Krebs Cycle) take place?

- A) Cytoplasm
- B) Inner mitochondrial membrane
- C) Mitochondrial matrix**
- D) Outer mitochondrial membrane

14. The Electron Transport System (ETS) occurs along which part of the mitochondrion?

- A) Outer membrane
- B) Inner mitochondrial membrane**
- C) Mitochondrial matrix
- D) Cristae

15. What is established by the movement of high-energy electrons through proteins in the ETS?

- A) A concentration of glucose
- B) A proton gradient**
- C) A release of carbon dioxide
- D) A synthesis of pyruvate

16. During chemiosmosis, protons flow through an enzyme called:

- A) Pyruvate dehydrogenase
- B) ATP synthase**
- C) Cytochrome c oxidase
- D) NADH dehydrogenase

17. Which stage of aerobic respiration produces the majority of ATP?

- A) Glycolysis
- B) Acetyl-CoA Formation
- C) Citric Acid Cycle
- D) Chemiosmosis**

18. Why is the mitochondrion often called the 'Powerhouse of the Cell'?

- A) It is the site of photosynthesis
- B) It produces ribosomes
- C) It is the major organelle associated with aerobic cellular respiration**
- D) It stores genetic material

19. What is the main function of cristae in the mitochondrion?

- A) To store ATP
- B) To protect the mitochondrion
- C) To increase surface area for ATP production**
- D) To break down glucose

20. The matrix is the innermost fluid-filled region of the mitochondrion and is the main location for which cycle?

- A) Electron Transport System
- B) Glycolysis
- C) Citric Acid Cycle/Krebs Cycle**
- D) Chemiosmosis

21. In humans, carbon dioxide (CO₂) from aerobic respiration is removed from the body through the:

- A) Kidneys
- B) Lungs**
- C) Liver
- D) Skin

22. What does 'anaerobic' mean?

- A) With oxygen
- B) Without oxygen**
- C) In the presence of light
- D) Producing a large amount of ATP