WJEC England Biology GCSE

1.3 - Cell metabolism

Flashcards

What are enzymes?

What are enzymes?

Enzymes are biological catalysts that speed up the rate of metabolic reactions

Describe the structure of enzymes

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Enzymes are proteins that contain an active site that fits a specific substrate

Describe the lock and key hypothesis

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A substrate that fits the specific active site of the enzyme binds, a reaction occurs (catalysed by the enzyme) and then the products are released.

State 4 factors that affect enzyme function

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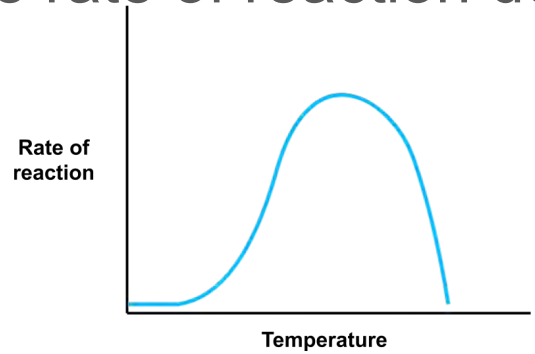
- Temperature
- pH
- Substrate concentration
- Enzyme concentration

Describe the effect of temperature on the rate of an enzyme-controlled reaction

Describe the effect of temperature on the rate of an enzyme-controlled reaction

- As the temperature increases, so does the rate of reaction
- Once the temperature exceeds the optimum, the enzyme denatures and the rate of reaction decreases



If temperature increases above the optimum, how does this affect enzyme function?

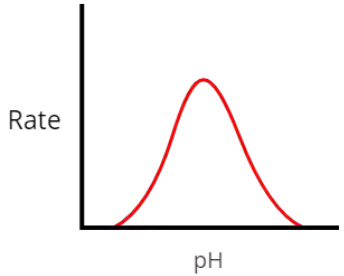
If temperature increases above the optimum, how does this affect enzyme function?

The active site will be distorted as the enzyme denatures and so it will no longer fit the substrate

Describe the effect of pH on the rate of an enzyme-controlled reaction

Describe the effect of pH on the rate of an enzyme-controlled reaction

- The rate of an enzyme catalysed reaction is fastest at the optimum pH
- If the pH is too high or low, the enzyme will work less efficiently and the active site may be denatured at extremes of pH



What is the purpose of respiration?

What is the purpose of respiration?

To produce energy in the form of ATP from larger molecules (like sugars)

What type of reaction is respiration?

What type of reaction is respiration?

Respiration is an exothermic reaction

When does aerobic respiration take place?

When does aerobic respiration take place?

When there is plenty of oxygen available

Where does aerobic respiration take place?

Where does aerobic respiration take place?

In the cytoplasm and mitochondria

What is the word equation for aerobic respiration?

What is the word equation for aerobic respiration?

Glucose + Oxygen → Carbon dioxide + Water (+ energy)

What is the symbol equation for aerobic respiration?

What is the symbol equation for aerobic respiration?

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O \ (+energy)$$

When does anaerobic respiration take place?

When does anaerobic respiration take place?

When there is little or no oxygen available

Where does anaerobic respiration take place?

Where does anaerobic respiration take place?

In the cytoplasm

What does anaerobic respiration in animals produce?

What does anaerobic respiration in animals produce?

Lactic acid and energy

What does anaerobic respiration in yeast produce?

What does anaerobic respiration in yeast produce?

Ethanol (alcohol), carbon dioxide and energy

Which type of respiration produces more ATP?

Which type of respiration produces more ATP?

Aerobic respiration which produces 36 ATP compared to anaerobic respiration which produces only 2 ATP as it is the incomplete breakdown of glucose

What is the oxygen debt?

What is the oxygen debt?

The extra oxygen that is needed to break down the lactic acid formed in anaerobic respiration

What type of molecules are carbohydrates and proteins?

What type of molecules are carbohydrates and proteins?

They are polymers

What are the monomers that make up proteins?

What are the monomers that make up proteins?

Amino acids

What type of enzymes break down carbohydrates?

What type of enzymes break down carbohydrates?

Carbohydrases

What type of enzymes break down proteins?

What type of enzymes break down proteins?

Proteases

What type of enzymes break down lipids and what are they broken down into?

What type of enzymes break down lipids and what are they broken down into?

Lipids are broken down by lipases into glycerol and fatty acids

What is the function of carbohydrates in the diet?

What is the function of carbohydrates in the diet?

Carbohydrates are the body's main source of energy

What are the functions of proteins in the body?

What are the functions of proteins in the body?

Proteins can have structural or metabolic roles in the body and are used as hormones, enzymes, antibodies, etc.

What is the function of lipids in the body?

What is the function of lipids in the body?

- Energy storage
- Cell membranes
- Buoyancy
- Insulation