

Assignment example

[Science](#), [Biology](#)



Biology Assignment Biology Assignment What are the functions of enzymes and discuss how they perform their functions? The main function of enzymes is to speed up the rate of chemical reactions during the digestive and metabolic processes. They act as biological catalysts. Reactions taking place in the cell become a million times faster when an enzyme is involved. The enzyme is specific for a substrate and attaches itself to the active site of the substrate to produce products. The enzyme is not used up during the reactions and does not undergo any change (“ Role of Enzymes in Biochemical Reactions”, n. d.).

What are some roles of plasma membranes?

Plasma membranes consist of phospholipid bilayers, which have two opposite ends: hydrophilic end (water-loving) and a hydrophobic end (water-repelling). These two ends help the cells mix properly with water.

Phospholipid bilayers contain transport and receptor proteins, which help the transport substances in and out of the cell. The plasma membrane is a semi-permeable membrane; it allows the substances needed for the functioning of the cell to enter, while filters out the rest. Also, the membrane helps maintain a cell potential inside the cell that assists in communication and the exchange of signals from outside the cell (Pandey, 2010)

What are the three major steps for cellular respiration and describe BRIEFLY the metabolic pathway in each.

The three steps for cellular respiration are glycolysis, The Krebs cycle, and the electron transport chain. Glycolysis is the process in which glucose molecules are broken down from carbohydrates into pyruvates. In this process, a phosphate is removed from ATP, which becomes ADP, and is given

to the glucose molecule, making it more chemically reactive. The Krebs cycle is an aerobic process, which means that it requires oxygen. It is a sequence of steps using enzymes as catalysts, which results in the complete oxidization of the Acetyl CoA molecule. The electron transport chain is the process in which most energy is released that has been trapped in the glucose molecule. The electron transport chain is a system of electron-carrying proteins that are found in the inner membrane of the mitochondria. The electrons are passed along these proteins and are finally joined with oxygen, which is the last electron acceptor (“ Understanding Cellular Respiration”, n. d.)

What are some major differences between respiration and fermentation?

Respiration makes use of oxygen to perform the function of electron acceptor to form ATP. During fermentation, inorganic electron donors are used to form ATP such as sulfur and methane. Although both the processes use the same substances to produce ATP, they vary in their respective processes and the amount of energy that is released. Respiration results in the production of 38 ATP, while fermentation only manages to produce 2 ATP. The production of ATP is slower in cellular respiration and quicker in fermentation. Also, respiration is much more effective in producing ATP than fermentation (Emelda, 2011)

What is/are the relationship between the light dependent and light independent reactions in photosynthesis?

Photosynthesis takes place in two stages: the light dependent stage (takes place in the thylakoid) and the light independent stage (takes place in the stroma). The light dependent reactions store sunlight and use it as chemical

energy to perform various functions. Therefore, the light dependent reaction gets its energy from sun light to undergo the process. Light independent reactions, also known as dark reactions, do not have a direct energy source; therefore, they depend on the products produced by the light dependent reactions to undergo the process (" Photosynthesis", n. d.).

LAB QUESTIONS

Describe how enzymes act as catalysts (include substrates, products, and active site).

Enzymes as biological catalysts are specific in nature and only bind to an active site of a particular substrate. The enzyme works through a lock and key mechanism. The active site on the substrate is the lock and the enzyme is the key. The enzyme will fit itself inside the active site to begin the reaction. Once the enzyme has attached itself, certain chemical reactions take place within the bonds substrate, and the substrate breaks into two products. The enzyme is released and does not undergo any change in composition, and can be used again (" How Do Enzymes Function?" n. d.)

How does substrate concentration affect the rate of enzyme reactions?

As the concentration of the substrate increases, the rate of enzyme reaction increases. But there comes a point when the substrate concentration does not have an effect on the rate, and the enzyme becomes saturated with the substrate. Then the rate depends on the activity of the enzyme, and the amount of substrate does not matter (" The Effect of Substrate Concentration on Enzyme Activity", n. d.)

How is hydrogen peroxide (H₂O₂) toxic to cells?

Hydrogen peroxide is highly toxic to cells, because it is an unstable and very

reactive compound. Our body's immune system makes use of the toxicity of H₂O₂ to destroy the bacterial cells. But the hydrogen peroxide, while destroying bacterial cells, can also harm and kill our essential body cells. Therefore, our cells release an enzyme called catalase, which aids in breaking down the toxic H₂O₂ into normal oxygen and water molecules (“How Does Hydrogen Peroxide Work to Cleanse a Wound?” n. d.)

What other enzyme in addition to catalase removes hydrogen peroxide from cells?

Superoxide dismutase. (Baxamusa, 2012)

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