Chapter 5 Review

1. ATP (Adenosine Triphosphate) - main source of energy for enzymatic reactions.

2. Anabolism - the synthesis of larger compounds.

3. Cofactors - molecules that aid in enzyme function.

4. Reaction rate - rate at which an enzymatic reaction occurs.

5. Substrate - molecule on which an enzyme acts.

6. Competitive inhibitor - molecule that looks like an enzyme and blocks enzyme function.

7. Metabolic pathway - series of enzyme-controlled reactions.

8. Catabolism - breakdown of compounds.

9. Active site - location where an enzyme binds.

10. Enzyme - protein that acts as a catalyst to speed up chemical reactions.

11. -ase - suffix that enzymes typically end in.

12. How an enzyme affects a chemical reaction:

Enzymes speed up chemical reactions by lowering the activation energy required for the reaction to occur. They bind to specific substrates at their active sites, forming an enzyme-substrate complex. The enzyme catalyzes the reaction, converting substrates into products, and then releases them, leaving the enzyme free to repeat the process.

13. Two factors affecting enzyme function:

- Temperature: Too high or too low can denature the enzyme, affecting its activity.
- pH: Extreme pH levels can also denature enzymes or alter their shape, reducing their effectiveness.

14. Competitive inhibition:

A competitive inhibitor mimics the substrate and competes for the active site of the enzyme, preventing the substrate from binding. This can be beneficial in regulating metabolic pathways.

15. Negative feedback in enzyme function:

Negative feedback occurs when the end product of a metabolic pathway acts as an inhibitor of an enzyme earlier in the pathway, preventing overproduction of the product.

16. Electron transport and proton pumps in ATP production:

During oxidative phosphorylation in the mitochondria, electrons are passed along the electron transport chain, releasing energy. This energy pumps protons (H+) across the membrane, creating a gradient. ATP synthase uses the proton gradient to generate ATP as protons flow back through it.