

Role and Mechanisms of Amino Acids in Enzyme Catalysis

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Abstract: *In biological systems, enzymes promote and speed up chemical reactions that are vital to life, a process known as enzyme catalysis. The building blocks of proteins, amino acids, are essential for the catalysis of enzymes. This study intends to investigate the many roles that amino acids play in enzymatic processes as well as the unique ways via which they raise catalytic activity. An extensive examination of the relationships between different amino acid residues and substrates, coenzymes, and other enzyme constituents will be provided in this study. Additionally, the molecular processes via which amino acids support transition state stabilization, enzyme activity modulation, and enzyme specificity will be covered. The study will also discuss current developments in our knowledge of amino acids' function in enzyme catalysis and how they may be used to create new enzymatic systems.*

Keywords: Amino acids, Enzyme catalysis, Mechanisms, Enzyme specificity, Transition state stabilization, Enzyme activity modulation, Substrates, Coenzymes.

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