Commentary

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# Short Note on Enzyme Inhibitors

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## About the Study

The cell is the basic building component of biological systems, both structurally and functionally. Biocatalysts, often known as enzymes, are biocatalysts with high catalytic efficiency and substrate and reaction specificity that may be used successfully by cells. Enzymes have incredible catalytic power, and their great substrate specificity makes them ideal for biological reactions. They play an important role in cellular metabolism. As a direct result of enzyme catalysis, every chemical reaction that occurs in plants, microorganisms, and animals occurs at a quantifiable rate. The majority of biochemistry's history is linked to enzyme study, either directly or indirectly. In the early 1800s, study into the digestion of meat led to the discovery of catalysis in biological systems. The catalytic activity of stomach secretions, the conversion of starch into sugar by saliva, and other plant extracts.

## Enzyme Properties

Enzymes, also known as biocatalysts, are complex protein molecules created by living cells. They are highly particular in both the processes they catalyse and the reactants they choose, which are referred to as substrates. Enzymes are liquid, colloidal, and organic catalysts that are created by living cells yet have the ability to work independently of them. Enzymes are currently being used in a variety of industries, including food, feed, paper, leather, agriculture, and textiles, resulting in significant cost savings. Simultaneously, rapid scientific advancement is driving the chemistry and pharmaceutical sectors to embrace enzyme technology, a trend that is being fueled by issues about energy, raw materials, and health.

## Enzyme Inhibition

Enzymes catalyse nearly every cellular function. Modifiers are inorganic and organic compounds that modify the catalytic activity of specific enzymes. Activators (Positive modifiers) are compounds that increase enzyme activity, while inhibitors (Negative modifiers) are substances that decrease enzyme activity.

Enzyme inhibitors are compounds that turn enzymes into inactive substances, slowing down the rate of an enzyme-catalyzed reaction. Enzyme inhibition is the term for this type of process. There are two types of enzyme inhibitions: reversible and irreversible, depending on whether the enzyme inhibitor complex dissociates quickly or very slowly.

Types of Enzyme Inhibition:

There are two types of Enzyme Inhibitors:

1. Reversible
2. Irreversible

Reversible Enzyme Inhibitors are further classified in to three types:

1. Competitive inhibition

2. Uncompetitive inhibition

3. Non-Competitive inhibition

### 1. Competitive inhibition

The inhibitor can mix with the free enzyme in such a way that it competes for binding at the active site with the regular substrate. Substrate analogue Inhibition seems to be another name for it. Similar to the Enzyme-Substrate complex [ES], an Enzyme-Inhibitor complex [EI] is generated. The rate of inhibition can be decreased by increasing the substrate concentration.

### 2. Uncompetitive inhibition

The inhibitor does not interact with the free enzyme or its regular substrate, but it does interact with the enzyme-substrate complex. In this an inactive Enzyme-Substrate Inhibitor complex [ESI] is created, which prevents the usual product from undergoing further processing.

### 3. Non-competitive inhibition

The inhibitor can bind to either the free enzyme or the enzyme-substrate complex, preventing both from working properly. Inhibitors bind to a place other than the active site of the enzyme. Inhibitors frequently modify the enzyme, preventing it from forming the [ES] complex at its normal rate and, if created, from decomposing at its normal rate to give products. [ESI] and [EI], two inactive complexes, are produced.

## Conclusion

The majority of biochemistry's history is linked to enzyme study, either directly or indirectly. In the early 1800s, study into the digestion of meat led to the discovery of catalysis in biological systems. The catalytic activity of stomach secretions, the conversion of starch into sugar by saliva, and other plant extracts.