Editorial
Volume 11:8, 2021

Journal of Bioprocessing & Biotechniques

ISSN: 2155-9821 Open Access

Bio Catalysts: The Enhancer of Bio Chemical Reaction

Piyush Kumar*

Department of Biotechnology, Indian Institute of Technology, Delhi, India

Description

Proteins' primary function is to operate as enzymes-catalysts that accelerate almost all chemical processes within cells. Although RNAs can catalyze some processes, proteins are responsible for the majority of biological reactions. In the absence of enzyme catalysis, most biological activities would be too slow to proceed at the mild temperature and pressure conditions. Enzymes accelerates such mechanisms by a factor of over a million, thus reactions that would take years to complete without catalysis may now be accomplished in fractions of a second if catalysed by the appropriate enzyme. Thousands of different enzymes are found in cells, and their activity control which of the many potential chemical reactions occur within the cell.

A substrate's binding to an enzyme's active site is quite a specialized interaction. On the surface of an enzyme, active sites are clefts or grooves that are generally made up of amino acids from numerous contexts of the polypeptide chain and brought together in the folded protein's tertiary structure. Non-covalent interactions, including as hydrogen bonds, ionic bonds, and hydrophobic interactions, initially, binds substrates to the active site. Multiple processes can increase the conversion of a substrate to the reaction's product after it is attached to the active site of an enzyme.

The enzymatic catalysis is a reaction which occurs between two substrates *via* enzymes. The enzyme acts as a template for bringing the two substrates together in the proper orientation and position for reaction. Enzymes catalyze processes by causing their substrates' conformation to approach that of the transition state. The lock-and-key model is the most basic model of enzyme-substrate interaction, in which the substrate fits perfectly into the active site. In many circumstances, however, substrate binding modifies the configurations of both the enzyme and the substrate, a process known as induced fit. In such circumstances, the substrate's conformation is changed to more closely approximate that of the transition state.

A whole cell bio-catalyst executes a wide range of chemical reactions that are useful in pharmaceutical industry. Whole cells, although less costly than purified enzymes, have intrinsic response rate, restrictions owing to the cell membrane's transport barrier. It's also a great idea to immobilise the biocatalysts so that they can be easily separated from the reaction mixture. A study reveals a microbial exoskeleton using a Layer-by-Layer (LbL) self-assembly approach that immobilised, shielded, and increased the reactivity of a whole cell biocatalyst. The microbial exoskeleton also protected the biocatalyst against a range of external stresses, including desiccation, freeze/thaw, high temperature exposure, osmotic shock, and protozoa predation.

Biocatalysts can also be utilised to replace chemical catalysts, with the advantage of eliminating the hazardous by-products of chemical catalysis. This makes it cleaner and eliminates the need for toxin removal. Another benefit of utilising enzymes is their selectivity and ability to act in low-temperature environments. Because enzymes are bigger than chemical catalysts, there are more sites of interaction between the substrate and the enzyme. Enzymes may work in milder settings since they are biological molecules; this implies that the substrate and newly produced molecules do not need to be shielded throughout the process. Protein engineering can also be used to make changes to the enzyme so that it can operate with a new substrate. Enzymes can now be used in the pharmaceutical sector because to advancements in enzyme access and protein engineering.

How to cite this article: Kumar, Piyush. "Bio Catalysts: The Enhancer of Bio Chemical Reaction ." *J Bioprocess Biotech* 11 (2021): 405.

***Address to Correspondence:** Piyush Kumar, Department of Biotechnology, Indian Institute of Technology, Delhi, India, E-mail: kumar123@gmail.com*

Received: October 20, 2021; **Accepted**: November 03, 2021; **Published**: November 10, 2021