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Special Issue Reprint

The Characterization and Application of Enzymes in Bioprocesses

Edited by: Loredana Marcolongo

Enzymes are indispensable biological catalysts that enhance the efficiency and sustainability of modern bioprocesses. This Reprint, titled “The Characterization and Application of Enzymes in Bioprocesses”, presents a diverse collection of original research and review articles that highlight recent advances in enzymology, protein engineering and biotechnology. The articles explore a variety of enzymatic systems, such as polyphosphate kinases for ATP regeneration, cellulases for biomass conversion, and specialized enzymes for biodegrading recalcitrant plastic waste.

Contributors to this Special Issue utilize multidisciplinary approaches, combining biochemistry, structural biology and computational modeling to enhance enzyme stability, specificity and catalytic activity. Key studies address critical industrial challenges, such as maintaining activity under extreme pH and temperature conditions and optimizing fermentation parameters to improve scalability and yield. From engineering biocatalysts for the food and wine industries to characterizing organelle-specific enzymes in plants, this Reprint provides significant insights into how tailored enzymes are transforming the pharmaceutical, agricultural and environmental sectors. By bridging the gap between fundamental molecular characterization and practical industrial application, this collection is a valuable resource for understanding and harnessing the full potential of enzymes in a bio-based economy.



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