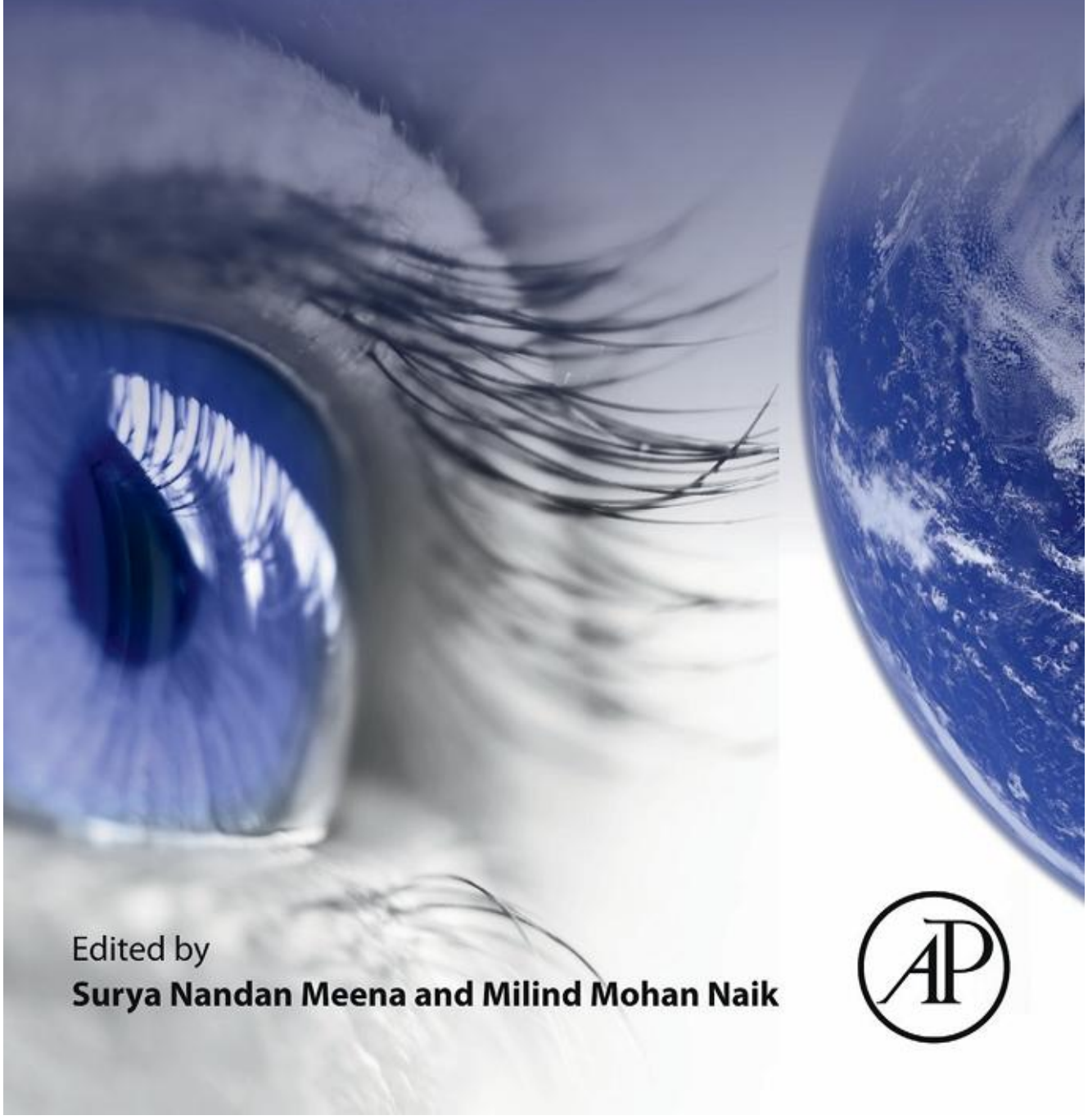
Advances in Biological Science Research

A Practical Approach



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Chapter 6

Technological advancements in industrial enzyme research

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6.1 Introduction

Enzymes, commonly known as biocatalysts, are biomolecules that catalyze several biological as well as industrial processes. Industrial enzymes form a greener and better option in a multitude of processes that lead to the final commercial product formation. A significant number of enzymes have been applied in industries to cater to various needs in medicine, agriculture, bioremediation, biofuel, and commodity production such as textiles, detergents, pulp and paper, cosmetics, beverages, nutraceuticals, and leather. Several of these industrial enzymes are derived from recombinant microorganisms. Manufacturers often turn to molecular genetic techniques either to tailor enzymes with improved properties or to produce enzymes from microorganisms that do not survive culture conditions in laboratory or industries. Recombinant strains of microorganisms are created after judicious selection of hosts for enhanced production of enzymes with specificity and for easy downstream processing. Technological advances in molecular genetics, bioinformatics, and cell biology have thus dictated the terms and possibilities in enzyme research and production.

The field of enzyme research has seen some remarkable changes with respect to the manner of approaching the problems of screening for variants of enzymes, discovery of novel enzymes, as well as enzyme profiling and/or engineering to create "altered" enzymes that fulfill specific industrial needs. The next generation sequencing (NGS) methods have provided a platform with novel solutions in enzyme research, as in other fields. Enzymologists have

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