
Preface

Enzyme stabilization has been an area of research interest since the 1950s, but in the last three decades, researchers have made tremendous progress in the field. This has opened up new opportunities for enzymes in molecular biology as well as industrial applications, such as bioprocessing, biosensors, and biofuel cells.

The first chapter introduces the reader to the field of enzyme stabilization and the different theories of enzyme stabilization, including the use of immobilization as a stabilization technique. The first part of the book will focus on protocols for enzyme stabilization in solutions including liposome formation, micelle introduction, crosslinking, and additives, while the second part of the book will focus on protocols for enzyme stabilization during enzyme immobilization including common techniques like sol-gel encapsulation, polymer encapsulation, and covalent attachment to supports. Protocols for a variety of enzymes are shown, but the enzymes are chosen as examples to show that these protocols can be used for both enzymes of biological importance and enzymes of industrial importance. The final chapter will detail spectroscopic protocols, methods, and assays for studying the effectiveness of the enzyme stabilization and immobilization strategies.

The chapters of this volume should provide molecular biologists, biochemists, and biomedical and biochemical engineers with the state-of-the-art technical information required to effectively stabilize their enzyme of interest in a variety of environments (i.e., harsh temperature, pH, or solvent conditions).

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Enzyme Stabilization and Immobilization

Methods and Protocols

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