

CONTENTS

Contributors	vii
Preface	ix
PART A NEW APPROACHES TO FINDING AND MODIFYING ENZYMES	1
1 Functional Metagenomics as a Technique for the Discovery of Novel Enzymes and Natural Products	3
<i>Luke A. Moe, Matthew D. McMahon, and Michael G. Thomas</i>	
2 Directed Enzyme and Pathway Evolution	41
<i>Jacob Vick and Claudia Schmidt-Dannert</i>	
3 Combining Natural Biodiversity and Molecular-Directed Evolution to Develop New Industrial Biocatalysts and Drugs	77
<i>Laurent Fourage, Céline Ayrinhac, Johann Brot, Christophe Ullmann, Denis Wahler, and Jean-Marie Sonet</i>	
4 Principles of Enzyme Optimization for the Rapid Creation of Industrial Biocatalysts	99
<i>Richard J. Fox and Lori Giver</i>	

PART B BIOCATALYTIC APPLICATIONS	125
5 Enzyme Catalysis in the Synthesis of Active Pharmaceutical Ingredients	127
<i>Animesh Goswami</i>	
6 Enzymatic Processes for the Production of Pharmaceutical Intermediates	185
<i>David Rozzell and Jim Lalonde</i>	
7 Novel Developments Employing Redox Enzymes: Old Enzymes in New Clothes	199
<i>Kurt Faber, Silvia M. Glueck, Birgit Seisser, and Wolfgang Kroutil</i>	
PART C BIOSYNTHETIC APPLICATIONS	251
8 Drug Discovery and Development by Combinatorial Biosynthesis	253
<i>Matthew A. DeSieno, Carl A. Denard, and Huimin Zhao</i>	
9 Reprogramming Daptomycin and A54145 Biosynthesis to Produce Novel Lipopeptide Antibiotics	285
<i>Richard H. Baltz, Kien T. Nguyen, and Dylan C. Alexander</i>	
10 Pathway and Enzyme Engineering and Applications for Glycodiversification	309
<i>Lishan Zhao and Hung-wen Liu</i>	
Index	363