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Nota di contenuto	Asymmetric Organic Synthesis with Enzymes; Contents; Preface; List of Contributors; I Methodology; 1 Medium Engineering; 1.1 Introduction; 1.2 Modulation of Enzyme Enantioselectivity by Medium Engineering; 1.2.1 Selectivity Enhancement by Addition of Water-Miscible Organic Cosolvents; 1.2.2 Selectivity Enhancement in Organic Media with Low Water Activity; 1.2.2.1 Organic Solvent Systems; 1.2.2.2 Enzyme Properties in Organic Solvents; 1.2.2.3 Medium Engineering; 1.2.3 Rationales; 1.2.4 Modulation of Enzyme Selectivity: New Trends of Research; 1.2.4.1 Ionic Liquids; 1.2.4.2 Additives 1.3 Conclusions and OutlooksReferences; 2 Directed Evolution as a Means to Engineer Enantioselective Enzymes; 2.1 Introduction; 2.2 Molecular Biological Methods for Mutagenesis; 2.3 High-throughput Screening Methods for Enantioselectivity; 2.4 Examples of Enhancing the Enantioselectivity of Enzymes by Directed Evolution; 2.4.1 Lipase from Pseudomonas aeruginosa (PAL); 2.4.2 Other Lipases; 2.4.3 Esterases; 2.4.4 Hydantoinases; 2.4.5 Nitrilases; 2.4.6 Epoxide

Hydrolases; 2.4.7 Phosphotriesterases; 2.4.8 Aminotransferases; 2.4.9 Aldolases
2.4.10 Cyclohexanone and Cyclopentanone Monooxygenases as Baeyer-Villigerases and Sulfoxidation Catalysts2.4.11 Monoamine Oxidases; 2.4.12 Cytochrome P450 Enzymes; 2.4.13 Other Enzymes; 2.5 Conclusions and Perspectives; References; 3 The Search for New Enzymes; 3.1 Introduction; 3.2 Mechanism-based Enzyme Design; 3.2.1 Catalytic Antibodies; 3.2.2 Rational Design of New Catalysts on Enzyme and Protein Basis; 3.2.3 Synthetic Enzyme Models; 3.3 Metagenomics; 3.3.1 Construction of Metagenome-derived DNA Libraries; 3.3.1.1 Selection of the Environment; 3.3.1.2 Cloning Strategies
3.3.1.3 Screening and Detection Technologies3.3.1.4 Major Problems that Need to be Addressed; 3.3.2 The Genomes of Not Yet Cultured Microbes as Resources for Novel Genes; 3.3.2.1 Polysaccharide Degrading/Modifying Enzymes; 3.3.2.2 Lipolytic Biocatalysts; 3.3.2.3 Vitamin Biosynthesis; 3.3.2.4 Nitrilases, Nitrile Hydratases, and Amidases; 3.3.2.5 Oxidoreductases/Dehydrogenases; 3.3.2.6 Proteases; 3.3.2.7 Glycerol Hydratases; 3.3.2.8 Antibiotics and Pharmaceuticals; 3.4 Conclusion; References; II Synthetic Applications; 4 Dynamic Kinetic Resolutions; 4.1 Introduction
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4.5.2 DKR of Hemithioathetals

Sommario/riassunto

Perfect for biochemists, synthetic and organic chemists, this book covers all important reactions, including C-C coupling reactions, oxidation reactions and many more. Divided into two parts, the first section on methodology presents new innovative methods for enzymatic catalysis optimization, including such new trends as medium engineering, directed evolution and computer-aided prediction of enantioselectivity. The second and main section deals with applications to synthesis, showing important reaction types and their applications. Only those reactions with very high selectivity are prese