

## PREFACE

This book was assembled with the intent of bringing together current advances and in-depth reviews of biocatalysis and biomolecular engineering with emphasis on agricultural biotechnology. The book consists of selected papers presented at the fourth International Symposium on Biocatalysis and Biotechnology held at the Academia Sinica, Taipei, Taiwan November 19–21, 2008. At this symposium, 60 distinguished international scientists from the United States, Japan, Korea, Canada, Brazil, Belgium, Slovak Republic, France, and Taiwan, shared their valuable research results. Additionally, there were 20 selected posters, one session for American Oil Chemists Society Asian Section, and two workshops for Biotech Developments and over 600 attendees. A few chapters contained in this book were contributed by distinguished scientists who could not attend this meeting. This meeting was a great success and we greatly appreciate President Dr. Chi-Huey Wong of Academia Sinica for providing the venue for the meeting. The contributions of local organization committee members are highly appreciated: Andrew H.-J. Wang, and Ming-Che Shih of Academia Sinica, and Yung-Sheng Huang, Chang-Hsien Yang of the National Chung Hsing University.

Recent energy and food crises point out the important of bio-based products from renewable resources and agricultural biotechnology. It is inevitable to use modern tools of molecular engineering on plants, animals and microorganisms to solve these crises and improve the wellness of humankind. There is no comprehensive book on molecular engineering of agricultural biotechnology and bio-based products from renewable resources. The authors are internationally recognized experts from all sectors of academia, industry, and government research institutes. This is the most current book on molecular engineering of agricultural biotechnology and bio-based industrial products.

This book composes of 30 chapters divided into three sections. The first 10 chapters describe the world's newest research on improvement of agronomic and microbial traits. Included are: Insights into the Structure and Function of Acyl-CoA: Diacylglycerol Acyltransferase, Improving Enzyme Character by Molecular Breeding-Preparation of Chimeric Genes, Production and Accumulation of Unusual Fatty Acids in Plant Tissues, Preparation of Oleaginous Yeast by Genetic Modification and Its Potential Applications, Improving Value of Oil Palm Using Genetic Engineering, Potential in Using Arabidopsis Acyl-Coenzyme-A-Binding Proteins in Engineering Stress-Tolerant Plants, Modification of Lipid Composition by Genetic Engineering in Oleaginous Marine Microorganisms: Thraustochytrid, Integrated Approaches to Manage Tomato Yellow Leaf Curl Viruses, Carbohydrate Acquisition During Legume Seed Development, and Biotechnology Enhancement of Phytosterol Biosynthesis in Seed Oils. The second section includes 8 chapters devoted to Functional Foods and Biofuels: Dietary Phosphatidyl Inositol in Metabolic Syndrome, Biotechnological Enrichment of Cereals with Polyunsaturated Fatty Acids, Brown Seaweeds Lipids as Possible Source for Nutraceuticals and Functional Foods, Lipophilic Ginsenosides Derivative Production, Processes for Production of Biodiesel Fuel, Noncatalytic Alcoholysis Process for Production of Biodiesel Fuel—Its Potential in Japan and Southeast Asia, Use of *Coniochaeta ligniaria* to Detoxify Fermentation Inhibitors Present in Cellulosic Sugar Streams, and Omics Applications to Biofuel Research. The third section with 12 chapters describes Renewable Bioproducts: Biotechnological Uses of Phospholipids, Application of Partition Chromatographic Theory on the Routine Analysis of Lipid Molecular Species, Dehydrogenase-Catalyzed Synthesis of Chiral Intermediates for Drugs, Engineering of Bacterial Cytochrome P450 Monooxygenase as Biocatalysts for Chemical Synthesis and Environmental Bioremediation, Glycosynthase from Inverting Hydrolases, Molecular Species of Diacylglycerols and Triacylglycerols Containing Dihydroxy Fatty Acids in Castor Oil, Biocatalytic Production of Lactobionic Acid, Recent Advances in Aldolase-Catalyzed Synthesis of Unnatural Sugars and Iminocyclitols, Production of Value-Added Products by Lactic Acid Bacteria, Enzyme Synthesis of Glycosides Using Alpha-Amylase Family Enzymes, Biological Synthesis of Gold and Silver Nanoparticles Using Plant Leaf Extracts and Antimicrobial Application, and Potential Approach of Microbial Conversion to Develop New Antifungal Products of Omega-3 Fatty Acids.

This book serves as reference for teachers, graduate students, and industrial scientists who conduct research in biosciences and biotechnology.

CHING T. HOU

Peoria, IL USA

JEI-FU SHAW

Taichung, Taiwan