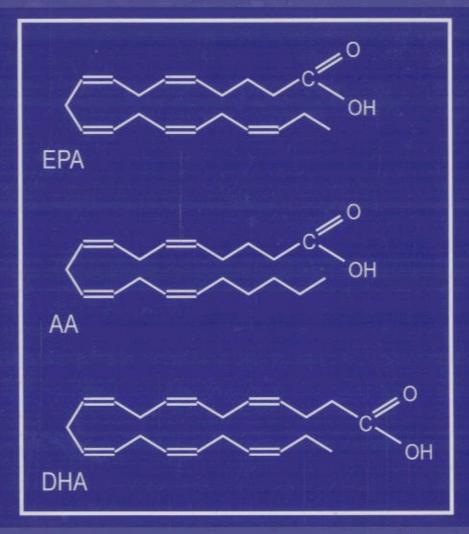
## BIOCATALYSIS AND BIOTECHNOLOGY FOR FUNCTIONAL FOODS AND INDUSTRIAL PRODUCTS



EDITED BY

Ching T. Hou Jei-Fu Shaw





## **Table of Contents**

## Section I Functional Foods

Chapter 1	Simultaneous Production of Starch-Derived Products and High-Protein Flour from Crops that Contain Starch and Protein by Enzymatic Process
Guan-Chiun	Lee, Jen-Jye Chen, and Jei-Fu Shaw
Chapter 2	Lipids as Functional Foods
Yung-Sheng	Huang
Chapter 3	Enzymatic Purification of Conjugated Linoleic Acid Isomers
Yuji Shimad	a, Toshihiro Nagao, and Takashi Kobayashi
Chapter 4	Lipase-Catalyzed Production of Human Milk Fat Substitutes (HMFS) Containing Gamma-Linolenic Acid (GLA) and Omega-3 Fatty Acids
Neşe Şahin,	Casimir C. Akoh, and Artemis Karaali
Chapter 5	Chemoenzymatic Synthesis of Structured Lipids Positionally Labeled with Pure Fatty Acids
Gudmundur	G. Haraldsson
Chapter 6	Functional Marine Complex Lipids79
Koretaro Ta	kahashi and Kenji Fukunaga
Chapter 7	Biofunctions of Marine Carotenoids91
Nakkarike N	anjbhatta Sachindra, Masashi Hosokawa, and Kazuo Miyashita
	Oil Production from Microorganisms
Chapter 9	Production of Conjugated Fatty Acids by Microorganisms121
Jun Ogawa,	Shigenobu Kishino, and Sakayu Shimizu

Chapter 10	γ-Polyglutamic Acid Produced by <i>Bacillus subtilis</i> ( <i>Natto</i> ): Structural Characteristics, Chemical Properties, and Biological Functionalities	137
	lo, Tong-Ing Ho, Kuo-Huang Hsieh, Yuan-Chi Su, Jeng Yang, Yang, and Shih-Ching Yang	
Chapter 11	The Effects of Black Tea on Blood Lipids and Cardiovascular Disease Risk in Humans	171
Gabriel K. H	arris, David J. Baer, and Beverly A. Clevidence	
Chapter 12	Xanthophylls and Polyunsaturated Fatty Acids Produced by Marine Thraustochytrids	187
	i, Takashi Yamasaki, Maya Nanko, ozaki, Seiji Kawamoto, and Kazuhisa Ono	
Chapter 13	Application of Redox Enzymes to the Production of New Sugar Derivatives	199
Hirofumi Nal	kano and Hiromi Murakami	
Chapter 14	Plant Sterols and their Esters as Functional Food Components	213
Phuong-Lan	Vu, Jeung Hee Lee, and Ki-Teak Lee	
Section l	II Industrial Products	
Chapter 15	Biotransformation of Aliphatic Hydrocarbons and Fatty Acids	227
Ching T. Hou	и	
Chapter 16	Arachidonic Acid-Producing Mortierella alpina:  Molecular Breeding of Mutants and Creation and Application of a Host-Vector System	267
Eiji Sakurade and Sakayu S	ani, Seiki Takeno, Takahiro Abe, Jun Ogawa, Shimizu	
Chapter 17	Biocatalysis: Synthesis of Chiral Intermediates for Pharmaceuticals	283
Ramesh N. P	atel atel	

Chapter 18	Enzymatic Synthesis of Cellobiose from Low Cost Carbohydrates	323
Hajime Tanig	ruchi, Masayuki Suzuki, and Motomitsu Kitaoka	
Chapter 19	Monoacyl Sugar Alcohols Synthesized through Lipase-catalyzed Condensation in an Organic Solvent	333
Shuji Adachi	and Junkui Piao	
Chapter 20	Vegetable Oil-Based Biodegradable Industrial Lubricants	349
Sevim Z. Erho	an and Brajendra K. Sharma	
Chapter 21	Progress of MAFF Nanotechnology Project in Japan	363
Mitsutoshi No	akajima and Kazutaka Yamamoto	
Chapter 22	Enzymatic Synthesis of Functional Lipids in Organic Solvent Using Lipase	375
Suk Hoo Yoo	n	
Chapter 23	Giving a New Twist for Protein Engineering of Glycoenzymes by the Concept of the α-Amylase Family	387
Takashi Kuril	ki	
Chapter 24	Plant Hydroperoxide Lyases and Related Enzymes	399
Venugopal M	endu and David F. Hildebrand	
Chapter 25	Metabolic Engineering of Polyunsaturated Fatty Acids in Plants	419
Martin Trukse	a, Guohai Wu, Patricia Vrinten, and Xiao Qiu	
Chapter 26	Fermentative Production of Biopolymers and Biosurfactants from Glycerol-Rich Biodiesel Coproduct Stream and Soy Molasses	431
Daniel K. Y. and William	Solaiman, Richard D. Ashby, Thomas A. Foglia, N. Marmer	
Chapter 27	Ionic Liquids: The Prospects of Enzyme-Catalyzed Glycosylations without Water	451
Neil P. Price		

Chapter 28	Structural and Functional Characterization of D-Aminoacylase from <i>Alcaligenes faecalis</i> DA1		
Wen-Lin Lai and Ying-Chieh Tsai			
Chapter 29	Identification of the Molecular Species of Triacylglycerols by HPLC and a Tetraacylglycerol (Acylacyl-Diacylglycerol) by High Resolution Electrospray Ionization Tandem Mass Spectrometry in Castor Oil		
Jiann-Tsyh Lin, Arthur Arcinas, and Clifton K. Fagerquist			
Chapter 30	Calculation of Rates for Enzyme and Microbial Kinetics via a Spline Technique		
K. Thomas Klasson			
Chapter 31	High Cell Density Culture Techniques for Production of Industrial Products		
Beom Soo Kim			
Chapter 32	Chemoprevention by Anthocyanidins and their Underlying Molecular Signaling Mechanisms		
Gow-Chin Yen, Chi-Tai Yeh, and Ping-Hsiao Shih			
Chapter 33	The Biotechnology of Producing and Stabilizing Living, Microbial Biological Control Agents for Insect and Weed Control		
Mark A. Jackson			
Chapter 34	The Castor Plant as a Dedicated Industrial Crop: Elucidation of the Enzymology of Castor Oil Biosynthesis545		
Thomas A. McKeon, Xiaohua He, Grace Chen, Yeh-Jin Ahn, Sung-Tae Kang, and Jiann-Tsyh Lin			
Index			