

Contents

<i>List of contributors</i>	page ix
<i>Preface to the second edition</i>	xiii
<i>Preface to the third edition</i>	xv

Part I Fundamentals and principles

Chapter 1	Public perception of biotechnology	3
	J. E. Smith	
Chapter 2	Biochemistry and physiology of growth and metabolism	25
	Colin Ratledge	
Chapter 3	Stoichiometry and kinetics of microbial growth from a thermodynamic perspective	55
	J. J. Heijnen	
Chapter 4	Genome management and analysis: prokaryotes	73
	Colin R. Harwood and Anil Wipat	
Chapter 5	Genetic engineering: yeasts and filamentous fungi	119
	David B. Archer, Donald A. MacKenzie and David J. Jeenes	
Chapter 6	Microbial process kinetics	155
	Jens Nielsen	
Chapter 7	Bioreactor design	181
	Yusuf Chisti	
Chapter 8	Mass transfer	201
	Henk J. Noorman	
Chapter 9	Downstream processing	219
	Marcel Ottens, Johannes A. Wesselingh and Luuk A. M. van der Wielen	

Chapter 10	Measurement, monitoring, modelling and control	251
	Bernhard Sonnleitner	
Chapter 11	Process economics	271
	Bjørn Kristiansen	
Part II	Practical applications	
Chapter 12	High-throughput screening and process optimisation	289
	Steven D. Doig, Frank Baganz and Gary J. Lye	
Chapter 13	The business of biotechnology	307
	Jason Rushton and Christopher Evans	
Chapter 14	Amino acids	335
	L. Eggeling, W. Pfefferle and H. Sahm	
Chapter 15	Organic acids	359
	Christian P. Kubicek and Levente Karaffa	
Chapter 16	Microbial polysaccharides and single cell oils	381
	James P. Wynn and Alistair J. Anderson	
Chapter 17	Environmental applications	403
	Philippe Vandevivere and Willy Verstraete	
Chapter 18	Production of antibiotics by fermentation	433
	Derek J. Hook	
Chapter 19	Strategies of cultivation	457
	Sven-Olof Enfors	
Chapter 20	Enzyme biotechnology	477
	Randy M. Berka and Joel R. Cherry	
Chapter 21	Recombinant proteins of high value	499
	Georg-B. Kresse	

Chapter 22	Insect and mammalian cell culture	523
	C. J. Hewitt, B. Isailovic, N. T. Mukwena and A. W. Nienow	
Chapter 23	Plant cell biotechnology	549
	Robert Verpoorte and Hens J. G. ten Hoopen	
Chapter 24	Biotransformations	579
	Pedro Fernandes and Joaquim M. S. Cabral	
Chapter 25	Immunochemical applications	627
	Mike Clarke	
Index		657