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Nota di contenuto	Contents; Current Books of Interest; Contributors; Preface; 1: Metabolic Engineering: Key for Improving Biological Hydrogen Production; 1.1 Introduction; 1.2 Metabolic engineering of bacterial systems for hydrogen production by dark fermentation; 1.3 Metabolic engineering of green algae, cyanobacteria, and bacteria for improving hydrogen production; 1.4 Future directions; 2: Biogas-producing Microbes and Biomolecules; 2.1 Introduction; 2.2 Biogas microbiology; 2.3 Biomethane; 2.4 Molecular methods for the study and control of biogas production; 2.5 Biogas from unconventional substrates 2.6 Future trends: algae2.7 Conclusions; 3: Engineering Recombinant Organisms for Next-generation Ethanol Production; 3.1 Introduction; 3.2 Overview of all microbial technologies for first- (1G) and second-generation (2G) ethanol production; 3.3 Xylose fermentation by Saccharomyces cerevisiae; 3.4 Hardening of S. cerevisiae against inhibitors formed during lignocellulose pretreatment; 3.5 CBP application to soluble and insoluble (raw, uncooked) starch fermentation; 3.6 Conversion of cellulose to ethanol by S. cerevisiae in a CBP configuration 3.7 Mining microbial diversity for novel enzymes for CBP application to starch and lignocellulose, including genomic and metagenomic and/or transcriptomic libraries as sources of novel enzymes/activities3.8 Process configurations for integration of 1G and 2G processes; 3.9 Discussion and conclusions; 4: Production of Biobutanol, from ABE to

Sommario/riassunto

The increasing worldwide demand for energy, combined with diminishing fossil fuel reserves and concerns about climate change, have stimulated intense research into the development of renewable energy sources, in particular, microbial biofuels. For a biofuel to be commercially viable, the production processes, yield, and titer have to be optimized, which can be achieved through the use of microbial cell factories. Using multidisciplinary research approaches, and through the application of diverse biotechnologies (such as enzyme engineering, metabolic engineering, systems biology, and synthetic