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Are Synergistic in the Development of Pharmaceutical Products; Success of the Pharmaceutical Industry in Research, Development, and Engineering Contributed to Rapid Growth but Also Resulted in Challenges; Growth of the Amino Acid/Acidulant Fermentation Industry; Production of Monosodium Glutamate (MSG) via Fermentation; The Impact of Glutamic Acid Bacteria on Monosodium Glutamate Cost Was Dramatic
Auxotrophic and Regulatory Mutants Enabled Production of Other Amino Acids Prices and Volumes Are Inversely Related; Biochemical Engineers Have a Key Function in All Aspects of the Development Process for Microbial Fermentation; References; Homework Problems; 2 New Biotechnology; Introduction; Growth of the Biopharmaceutical Industry; The Biopharmaceutical Industry Is in the Early Part of Its Life Cycle; Discovery of Type II Restriction Endonucleases Opened a New Era in Biotechnology; The Polymerase Chain Reaction (PCR) Is an Enzyme-Mediated, In Vitro Amplification of DNA
Impacts of the New Biotechnology on Biopharmaceuticals, Genomics, Plant Biotechnology, and Bioproducts Biotechnology Developments Have Accelerated Biological Research; Drug Discovery Has Benefited from Biotechnology Research Tools; The Fusing of Mouse Spleen Cells with T Cells Facilitated Production of Antibodies; Regulatory Issues Add to the Time Required to Bring a New Product to Market; New Biotechnology Methods Enable Rapid Identification of Genes and Their Protein Products; Genomics Is the Scientific Discipline of Mapping, Sequencing, and Analyzing Genomes
Products from the New Plant Biotechnology Are Changing the Structure of Large Companies that Sell Agricultural Chemicals Bioproducts from Genetically Engineered Microorganisms Will Become Economically Important to the Fermentation Industry; References; Homework Problems; 3 Bioproducts and Biofuels; Introduction; Biocatalysis and the Growth of Industrial Enzymes; Glucose Isomerase Catalyzed the Birth of a New Process for Sugar Production from Corn; Identification of a Thermally Stable Glucose Isomerase and an Inexpensive Inducer Was Needed for an Industrial Process
The Demand for High-Fructose Corn Syrup (HFCS) Resulted in Large-Scale Use of Immobilized Enzymes and Liquid Chromatography

Sommario/riassunto

Biotechnology introduces students in science, engineering, or technology to the basics of genetic engineering, recombinant organisms, wild-type fermentations, metabolic engineering and microorganisms for the production of small molecule bioproducts. The text includes a brief historical perspective and economic rationale on the impact of regulation on biotechnology production, as well as chapters on biotechnology in relation to metabolic pathways and microbial fermentations, enzymes and enzyme kinetics, metabolism, biological energetics, metabolic pathways, nucleic acids, genetic enginee