

# The Complete Book on Biotechnology Based Bulk Drugs

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Biotechnology has played an essential role in the development of the healthcare chemical industries. The range of product includes diagnostic, prophylactic and therapeutic agents. The discovery of a potentially active compound starts a sequence of exhaustive chemical and biological testing that may culminate in manufacture of the agent or an improved analog. The role of biotechnology in this complex path to regulatory approval and marketing is diverse. Biotechnology is a field of applied biology that involves the use of living organisms and bioprocesses in engineering, technology, medicine and other fields requiring bio products. Biotechnology also utilizes these products for manufacturing purpose. Some of the examples of drugs produced through biotechnology are penicillin, lincomycin, streptomycin, tylosin, peptide antibiotics, cephalosporins, etc. Modern use of similar terms includes genetic engineering as well as cell and tissue culture technologies. Biotechnology draws on the pure biological sciences and in many instances is also dependent on knowledge and methods from outside the sphere of biology. Conversely, modern biological sciences are intimately entwined and dependent on the methods developed through biotechnology and what is commonly thought of as the life sciences industry. The development of biotechnology is taking place in almost all fields of human life. The recent advances in the field of basic genetics have opened up new vistas, potentials and possibilities.

Some of the fundamentals of the book are the pharmaceutical industries, marketing strategy, common features in the evolution of products and processes, process technology fermentation, product recovery, new trends in biotechnology, penicillins, biosynthesis and regulation of thienamycin, olivanic acids and epithienamycins, aminoglycoside antibiotics, streptidine and deoxystreptamine, streptomycin, neomycin, paromomycin, ribostamycin and, butirosin gentamicin, micromomicin and sisomicin, tylosin, peptide antibiotics, current applications of peptides, blastidicin S: an agricultural antibiotic bleomycin and bestatin: peptides used in anticancer therapy etc.

The present book contains process of biotechnology based bulk drugs like penicillin, B lactam antibiotics, aminoglycoside antibiotics, peptide antibiotics, anti cancer agents, lincomycin etc. This is very resourceful book for entrepreneurs, technocrats, research scholars, libraries etc.

## CHAPTER 1

### INTRODUCTION

The Pharmaceutical Industries

Marketing Strategy

## Common Features in the Evolution of Products and Processes

Process Technology

Fermentation

Product Recovery

New Trends in Biotechnology

## CHAPTER 2

### PENICILLINS

Historical Perspective History

Biosynthetic Penicillins

Process Overview

Fermentation Technology

The Culture: Strain Development

Mutation

Selection

Genetics

Fermentation Process : Flow Sheet

Facilities

Inoculum Development

Fermentation Stage: Medium

Process Control

Physiological Variables and Their Effect on Product Formation

Duration of the Fermentation

Recovery of Penicillin

Carbon Process ( Obsolete)

Solvent Extraction Process (Industry Standard)

Process Overview

Filtration

Solvent Extraction

Carbon Treatment

Further Extraction

Crystallization

Drying

Further Processing

Penicillin Acid Process (State of the Art)

Semisynthetic Penicillins

6-Aminopenicillanic Acid

Enzymic Cleavage of Penicillins to Yield 6-Aminopenicillanic Acid

Chemical Preparation of 6-Aminopenicillanic Acid

Synthesis of Clinically Useful Penicillins and Closely Related Congeners

Automation

Process Economics

Costs

## CHAPTER 3

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Thienamycin

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Chemistry

Pharmacological Activity

Chemical Synthesis

Biosynthesis and Regulation of Thienamycin

Biosynthesis

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Classical Fermentation Process  
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Seed Stages  
Production Stage  
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Strain Improvement  
Fed-Batch Techniques  
Synthetic Media  
Novel Fermentation Processes  
Ultrafiltration Coupled Fermenter  
Immobilized Cells  
Thienamycin Purification  
Future Prospects  
Market Projections  
Clavulanic Acid  
Introduction  
Production  
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Olivanic Acids and Epithienamycins  
Nocardicins  
Introduction  
Production of Nocardicin A  
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Monobactams

## CHAPTER 4

### AMINOGLYCOSIDE ANTIBIOTICS

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Neomycin, Paromomycin, Ribostamycin and Butirosin  
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Fortamine and Fortimicins  
Mutasyntesis  
A-Factor  
Metabolic Grid  
Manufacture  
Fermentation  
Microorganisms  
Equipment  
Inoculum Development  
Media  
Procedures  
Isolation  
Strain Improvement

## CHAPTER 5

### TYLOSIN

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Development in the Genetic Improvement of Producing Strains  
Developments in Fermentation Technology

## CHAPTER 6

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Carboxyl Activation  
Peptide Bond Formation  
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Alternative Names and Synonyms Compounds Listed in the Table  
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Markets for Recombinant Products

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