

PS803: PHARMACEUTICAL BIOTECHNOLOGY**B. Pharm IV Year II sem**

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Course Objectives: Pharmaceutical biotechnology is considered to be a logical extension of pharmaceutical microbiology, thus expected to show a dramatic change in the drug product scenario in future. This course is designed to impart knowledge on isolation of industrially interesting microbes, various techniques employed in biotechnology Viz., r-DNA technology, Hybridoma technology, enzyme technology and the products derived using these techniques.

Course Outcome: Upon completion of the course, the student shall be able to-

- Know screening of industrially interesting microbes.
- Optimize fermentation process parameters
- Know about preparation, standardization, storage and labelling of biotechnologically derived products
- Know about bioinformatics and its applications in pharmacy.
- Know about the regulatory control of biotechnological products.

UNIT - I

a. Fermentation Technology: Isolation, Selection and Screening of Industrially important microbes, Strain improvement. Types of fermentations, optimization of fermentation process. Types, design & operation of Bioreactor.

b. Specific Fermentations: Selection of organism, fermentation & purification of various antibiotics, vitamins, aminoacids, organic acids, solvents, biomass like penicillin, streptomycin, tetracycline, erythromycin, cyanocobalamin, glutamic acid, citric acid, alcohol, Lactobacillus sporogenes.

UNIT - II

a. Recombinant DNA Technology: Introduction to r-DNA technology and genetic engineering, steps involved in isolation of enzymes, vectors, recombination and cloning of genes.

Production of r-DNA technology derived therapeutic proteins like humulin, humatrope, intron a, recombivax HB(hepatitis b).

b. Hybridoma Technology: Production and applications of Monoclonal Antibodies.

UNIT - III

Immunology & Immunological Preparations: Principles of Immunity, Humoral immunity, cell mediated immunity, Antigen – Antibody reactions, Hypersensitivity reactions.

Active & passive immunizations preparation of vaccines, standardization & storage of BCG, cholera, smallpox, polio, typhus, tetanus toxoid, immuno serum & diagnostic agents.

UNIT - IV

a. Enzyme Technology: Methods of immobilization of enzymes and cells and their applications, factors affecting immobilized enzyme kinetics, advantages of immobilized enzymes over isolated enzymes. Study of enzymes such as hyaluronidase, penicillinase, streptokinase & streptodornase, protease.

b. Blood Products: Collection processing, storage and control of official blood products, plasma substitutes (dextran) and sutures & ligatures.

UNIT - V

a. Microbial Transformations: Types, Methods of bioconversions & Application in Pharma Industry, Steroidal transformations.

- b.** An introductory study on bioinformatics and its applications, Regulatory control of Biotechnological products.

TEXT BOOKS

1. P. F. Stanbury & A. Whitaker, Principles of fermentation technology, Pergamon Press
2. Sambamurthy. K, Text Book of Pharmaceutical Biotechnology.
3. S. S. Kori, Pharmaceutical biotechnology.

REFERENCES

1. Wulf Crueger and Anneliese Crueger, Biotechnology, 2nd Ed, Publ- Panima publication co-
peration, New Delhi
2. U. Satyanarayana, Text book of Biotechnology