

AMB14 ANIMAL BIOTECHNOLOGY

UNIT-1 INTRODUCTION TO ANIMAL TISSUE CULTURE

Background, Advantages, Limitations, Application, Culture Environment, Cell Adhesion, Cell Proliferation, Differentiation.

UNIT-2 DESIGN, LAYOUT AND EQUIPMENT

Planning, Construction, Layout, Essential Equipments, Aseptic Technique, Objectives, Elements, Sterile Handling, Safety, Risk Assessment, General Safety, Fire, Radiation, Biohazards

UNIT-3 MEDIA

Physicochemical Properties, Balanced Salt Solutions, Complete Media, Serum, Serum-Free Media, Disadvantages of Serum, Advantages of Serum-Free media

UNIT-4 PRIMARY CULTURE

Isolation of Tissue, Steps involved in primary cell culture, Cell Lines, Nomenclature, Subculture and Propagation, Immobilization of cell lines, Cell line designations, Routine maintenance

UNIT-5 CHARACTERIZATION & QUANTITATION OF CELL LINE

Need for characterization, Morphology, Chromosome Analysis, DNA Content, RNA and Protein, Enzyme Activity, Antigenic Markers, Transformation, Immobilization, Aberrant Growth Control, Tumorigenicity, Cell counting, DNA content, Protein, Rates of Synthesis, Cell Proliferation, Plating Efficiency, Labeling Index, Generation Time.

UNIT-6 CONTAMINATION

Source of contamination, Type of microbial contamination, Monitoring, Eradication of Contamination, Cross-Contamination

UNIT-7 CRYOPRESERVATION

Need of Cryopreservation, Preservation, Cell banks, Transporting cells

UNIT-8 CYTOTOXICITY

Introduction, In vitro limitations, Nature of assay, Viability assay, Survival assay, Microtitration assay, Transformation assay

UNIT-9 TRANSGENIC ANIMALS

Methodology, Embryonic Stem Cell method, Microinjection method, Retroviral vector method, Applications of transgenic animals

UNIT-10 GENE THERAPY

Ex-vivo gene therapy, In vivo gene therapy, Viral gene delivery system, Retrovirus vector system, Adenovirus vector system, Adeno-Associated virus vector system, Herpes simplex virus

vector system, Non-viral gene delivery system, Prodrug activation therapy, Nucleic acid therapeutic agents

UNIT-11 IN VITRO FERTILIZATION AND EMBRYO TRANSFER

Composition of IVF media, Steps involved in IVF, Fertilization by means of micro insemination, PZD, ICSI, SUZI, MESA

Reference Books

1. Animal Cell Culture by John R.W. Masters Oxford University Press
2. Introduction to Cell and Tissue Culture by Jennie P. Mather and Penelope E. Roberts Plenum Press, New York and London
3. Molecular Biotechnology: Primrose.
4. Animal Cell Biotechnology: R.E. Spier and J.B. Griffiths (1988), Academic press.

