

OBJECTIVES: To enable the students to –

- acquire knowledge about Plant tissue culture its uses and techniques involved in tissue culture
- Study Animal biotechnology which includes Artificial insemination, *in vitro* fertilization and embryo transfer.

PLANT BIOTECHNOLOGY

COURSE

UNIT I: PLANT TISSUE CULTURE

- a. Composition of media (MS and Gamborg's only). Preparation of media and methods of sterilization.
- b. Role of plant growth regulators in differentiation.
- c. Initiation and maintenance of callus and suspension cultures; Single cell clones

UNIT II: APPLICATIONS OF TISSUE CULTURE

- a. Meristem culture and production of virus free plants. Somatic embryogenesis and organogenesis.
- b. Micropropagation, regeneration, production of haploids, protoplast culture and Somatic hybridization.
- c. Mass cultivation of cell cultures and process engineering – batch and continuous culture Bioreactor.
- d. Production of commercially useful compounds by plant cell culture.

UNIT III: GENE TRANSFER IN PLANTS

- a. Gene transfer through Agrobacterium, Ti plasmid.
- b. Applications of r-DNA technology in agriculture (Bt-cotton, Golden Rice)
- c. Production of therapeutic proteins from transgenic plants

ANIMAL BIOTECHNOLOGY

UNIT IV: ANIMAL CELL CULTURE

- a. Introduction to Animal Biotechnology.
- b. Principles of animal cell culture – culture vessel.
- c. Cell culture media preparation, sterilization, types of cultures.
- d. Characteristics of cells in culture: Contact inhibition, anchorage dependence, cell – cell communication etc., Cell senescence; Cell and tissue response to trophic factors. Immortal cells, Cell lines.
- e. Maintenance and Preservation of cell lines.

UNIT V : APPLICATIONS OF ANIMAL BIOTECHNOLOGY

- a. *In vitro* fertilization and embryo transfer technology.
- b. Production of transgenic animals and molecular pharming (mice, sheep).

REFERENCES

1. Plant tissue culture-Basic and Applied-by Timir Baran Jhan and B.Ghosh
2. Essential of biotechnology for students by Satya N.Das
3. Plant tissue culture by Kalyan Kumar De -
4. Animal cells as bioreactor – by Terence Gartwright, Cambridge University press
5. Introduction to veterinary genetics by F.W.Nicholas, Oxford university press.

ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) , VISAKHAPATNAM
V SEMESTER **BIOTECHNOLGY** 2 Hrs/Week
BTH 5751 (2) **PLANT AND ANIMAL BIOTECHNOLOGY** Max. Marks:50
w.e.f. 2015-2018 (AC Batch) **PRACTICALS**

OBJJECTIVE: To enable the students to acquire the techniques and inoculation methods in plant tissue culture

COURSE: Experiments on

1. Preparation of MS Media and its Chemical composition
2. Preservation of tissue culture plants under cold conditions
3. Pollen culture
4. Seed culture
5. Anther culture

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