

DISCIPLINE CENTRIC ELECTIVE COURSES
DSE 1

ANIMAL BIOTECHNOLOGY

THEORY

(Credits 4)

Unit 1

Introduction

- 1.1 Concept and scope of biotechnology
- 1.2 Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda Bacteriophage, and Expression vectors (characteristics)
- 1.3 Restriction enzymes: Nomenclature, detailed study of Type II.
- 1.4 Transformation techniques: Calcium chloride method and electroporation.

Unit 2

Gene manipulation

- 2.1 Construction of genomic and cDNA libraries and screening by colony and plaque hybridization
- 2.2 Southern, Northern and Western blotting
- 2.3 DNA sequencing: Sanger method
- 2.4 Polymerase Chain Reaction, DNA Finger Printing and DNA micro array

Unit 3

Genetically Modified Organisms

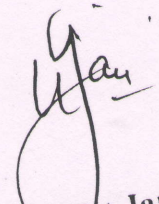
- 3.1 Production of cloned and transgenic animals: Nuclear Transplantation, Retroviral Method, DNA microinjection
- 3.2 Transgenic animals (mice, cattle, sheep, goat, birds, fishes)
- 3.3 Applications of transgenic animals
- 3.4 Production of pharmaceuticals, production of donor organs, knockout mice.

Unit 4

Culture Techniques and Applications

- 4.1 Preparation of growth media
- 4.2 Microbial culture techniques and management
- 4.3 Molecular diagnosis of genetic diseases
- 4.4 Recombinant DNA in medicine (recombinant insulin and human growth hormone), gene therapy

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SEM-IV

Zoology

ZO1E05E516.

ANIMAL BIOTECHNOLOGY

PRACTICAL

(Credits 2)

1. Restriction digestion of plasmid DNA.
2. To study following techniques through photographs
 - a) Southern Blotting
 - b) Northern Blotting
 - c) Western Blotting
 - d) DNA Sequencing (Sanger's Method)
 - e) PCR
 - f) DNA fingerprinting
3. Project report on animal cell culture

SUGGESTED READINGS

- ☐ Brown, T.A. (1998). *Molecular Biology Labfax II: Gene Cloning and DNA Analysis*. II Edition, Academic Press, California, USA.
 - ☐ Glick, B.R. and Pasternak, J.J. (2009). *Molecular Biotechnology - Principles and Applications of Recombinant DNA*. IV Edition, ASM press, Washington, USA.
 - ☐ Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009). *An Introduction to Genetic Analysis*. IX Edition. Freeman and Co., N.Y., USA.
 - ☐ Snustad, D.P. and Simmons, M.J. (2009). *Principles of Genetics*. V Edition, John Wiley and Sons Inc.
 - ☐ Watson, J.D., Myers, R.M., Caudy, A. and Witkowski, J.K. (2007). *Recombinant DNAGenes and Genomes- A Short Course*. III Edition, Freeman and Co., N.Y., USA.
 - ☐ Beauchamp, T.I. and Childress, J.F. (2008). *Principles of Biomedical Ethics*. VI Edition, Oxford University Press.
- CBCS Undergraduate Program in Zoology


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