

CERTIFICATE COURSE
ON
Tools and Techniques
of
Recombinant DNA Technology
2022-23



DEPARTMENT OF ZOOLOGY
GOVERNMENT DEGREE COLLEGE
PALAKONDA
PARVATHIPURAM MANYAM DISTRICT

B. RAJU
COURSE COORDINATOR

Dr. G. JANARDHANA NAIDU
PRINCIPAL

BROCHURE

Certificate Course on Tools and Techniques in Recombinant DNA Technology 2022-23

GENERAL INFORMATION AND COURSE STRUCTURE

Duration of module Training: 30 hrs.

Entry Qualification: UG students

Language: English/ Telugu

Teaching mode: Offline and online

INSTRUCTION METHOD

Lecture method

PDF Video lessons

Demonstration

Group discussion



Assessment

Assignments: 40%

Course End Examinations: 60%

Course coordinators:

Sri. B. Raju, Lecturer in Zoology

Conducted by

Department of Zoology

OBJECTIVES

Students will be able to define
Recombinant DNA technology.

Students will be able to categorize
types of restriction enzymes used in
recombinant DNA technology.

Students will be able to accurately
describe their observations in cloning
vectors.

Students will be able to get
knowledge on Gene delivery methods
in modification of DNA.

Students will be able to get
knowledge on hybridization
techniques such as southern,
northern, and western blotting.

Dr. G. Janardhana Naidu

Principal

INTRODUCTION

Recombinant DNA Technology, the driving force behind biotechnology and genetic studies, is a must-know skill for every aspiring researcher. Recombinant DNA Technology is the construction of new DNA molecules by combining at least two different DNA molecules. This process was first discovered in the early 1970s and since then has proven to be an indispensable technology in every Biotech laboratory.

Recombinant DNA Technology has found its applications in many different fields. It is a common process in Biotech, medical research, and genetics studies. By manipulating the desired cells, we are now able to produce many medically important molecules, proteins, etc. This technology also plays an important role in agriculture and animal studies. Genetically modified crops or organisms are the results of this ever-expanding field.

OBJECTIVES

- ❖ Students will be able to define Recombinant DNA technology
- ❖ Students will be able to explain tools of recombinant DNA technology
- ❖ Students will be able to categorize types of restriction enzymes used in recombinant DNA technology
- ❖ Students will be able to describe about different types of DNA modifying enzymes
- ❖ Students will be able to accurately describe their observations in cloning vectors
- ❖ Students will be able to identify the techniques of recombinant DNA technology
- ❖ Students will be able to get knowledge on Gene delivery methods in modification of DNA
- ❖ Students will be able to accurately describe the basic knowledge on PCR
- ❖ Students will be able to explain DNA sequencing methods
- ❖ Students will be able to get knowledge on hybridization techniques such as southern, northern, and western blotting
- ❖ Students will be able to describe about Genomic and cDNA libraries

OUT COMES

At the end of this course, Students should be able to

- Define the Recombinant DNA technology
- Explain tools of recombinant DNA technology
- categorize types of restriction enzymes used in recombinant DNA technology
- accurately describe their observations in cloning vectors
- get knowledge on Gene delivery methods in modification of DNA
- accurately describe the basic knowledge on PCR
- explain DNA sequencing methods
- get knowledge on hybridization techniques such as southern, northern, and western blotting
- describe about Genomic and cDNA libraries

GENERAL INFORMATION AND COURSE STRUCTURE

1. Duration of module Training: 4 Weeks
2. Entry Qualification: UG students
3. Language: English/ Telugu
4. Teaching mode: Offline and online

SYLLABUS CONTENT Detailed syllabus

WEEK 1:

I. Tools of Recombinant DNA technology

- Restriction modification systems: Types I, II and III.
- Mode of action, nomenclature
- Applications of Type II restriction enzymes in genetic engineering
- DNA modifying enzymes and their applications:
 - ❖ DNA polymerases.
 - ❖ Terminal deoxynucleotidyl transferase,
 - ❖ kinases and phosphatases, and
 - ❖ DNA ligases

WEEK 2:

- Cloning Vectors:
 - ❖ Plasmid vectors: pBR and pUC series,
 - ❖ Bacteriophage lambda and
 - ❖ M13 based vectors,
 - ❖ Cosmids,
 - ❖ BACs, YACs.

WEEK 3:

II. Techniques of Recombinant DNA technology

- Cloning: Use of linkers and adaptors
- Gene delivery:
 - ❖ Microinjection
 - ❖ Electroporation
 - ❖ Biolistic method (gene gun)
 - ❖ Liposome and
 - ❖ Viral-mediated delivery
- PCR: Basics of PCR.

WEEK 4:

- DNA Sequencing:
 - ❖ Sanger's method of DNA sequencing- traditional and automated sequencing
 - Hybridization techniques:

- ❖ Southern blotting
- ❖ Northern blotting and
- ❖ Western blotting.
- Genomic and cDNA libraries:
- ❖ Preparation and
- ❖ uses

INSTRUCTION METHODS

Some of the following method of delivery may be adopted

1. Lecture
2. PDF/ Video lesson
3. Demonstrations
4. Group discussions

ASSESSMENT

1. Assignments: 40%
2. Course End Examination: 60%

Assessment Mode: Descriptive and multiple-choice answers

Examination conduction: Offline

Grading system:

Marks range	Grade
90 to 100	A ⁺
80 to 89	A
70 to 79	B ⁺
60 to 69	B
50 to 59	C
40 to 49	D
Below 40	Fail

The syllabus for value added course / certificate course on vermicomposting is hereby approved for the session 2022-23

Course coordinator

Head of the Department

HOD of Zoology
Govt. Degree College
Palakonda, SKLM. (2022-23)

Principal
GOVT. DEGREE COLLEGE
PALAKONDA
Parvathipuram Manyam Dist.

Student Enrollment List


Name of the Certificate course: Tools and Techniques of Recombinant DNA Technology


Department: Zoology

Academic year: 2022-23


S. No.	Name of the Student	Class	Date of Enrollment	Remarks
1	A Usharani	1 st B.Sc. BZC	1 st April	Admitted
2	B Yuvasri	1 st B.Sc. BZC	1 st April	Admitted
3	J Yamuna	1 st B.Sc. BZC	1 st April	Admitted
4	K Santhoshi	1 st B.Sc. BZC	1 st April	Admitted
5	K Ravi	1 st B.Sc. BZC	1 st April	Admitted
6	K Ashish	1 st B.Sc. BZC	1 st April	Admitted
7	M Sangeetha	1 st B.Sc. BZC	1 st April	Admitted
8	S Chamanthi	1 st B.Sc. BZC	1 st April	Admitted
9	S Suneela	1 st B.Sc. BZC	1 st April	Admitted
10	S Karthik	1 st B.Sc. BZC	1 st April	Admitted
11	V Mounika	1 st B.Sc. BZC	1 st April	Admitted
12	V Haritha	1 st B.Sc. BZC	1 st April	Admitted

Course coordinator


Head of the Department
HOD of Zoology
Govt. Degree College
Palakonda, SKLM. (Dt.)


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S.NO	Name of the Student	27/4	28/4	29/4	30/4	1/5	2/5	3/5	4/5	5/5	6/5	7/5	8/5	9/5	10/5	11/5	12/5
1	A. Usharani	P	P	P	A	P	P	P	P	A	P	P	P	P	P	P	P
2	B. Yuvabri	P	P	P	P	A	P	P	P	P	P	P	A	P	P	P	P
3	J. Yamuna	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	K. Santoshi	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P
5	K. Ravi	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	K. Ashish	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P
7	M. Sangeetha	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P
8	S. Chamanthi	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	S. Suneela	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P
10	S. Karthik	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P
11	V. Hounika	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P	P
12	V. Haritha	P	P	P	P	A	P	P	P	P	A	P	P	P	P	P	P


 HOD of Zoology
 Govt. Degree College
 Palakonda, SKLM. (Dt.)

Student Examinations Marks List

Name of the Certificate course: Tools and Techniques of Recombinant DNA Technology

Department: Zoology

Academic year: 2022-23

S. No.	Name of the Student	Class	Week 1 Assignment 10 M	Week 2 Assignment 10 M	Week 3 Assignment 10 M	Week 4 Assignment 10 M	Course End Examination 60M	Total Marks 100 M	Pass/Failed Grade
1	A Usharani	1 st B.Sc. BZC	7	8	8	7	46	76	B ⁺
2	B Yuvasri	1 st B.Sc. BZC	8	8	7	8	49	80	A
3	J Yamuna	1 st B.Sc. BZC	8	7	8	7	48	78	B ⁺
4	K Santhoshi	1 st B.Sc. BZC	8	8	9	8	48	81	A
5	K Ravi	1 st B.Sc. BZC	9	9	9	9	55	91	A ⁺
6	K Ashish	1 st B.Sc. BZC	9	9	9	9	55	91	A ⁺
7	M Sangeetha	1 st B.Sc. BZC	8	8	9	9	49	83	A
8	S Chamanthi	1 st B.Sc. BZC	8	7	8	7	48	78	B ⁺
9	S Suneela	1 st B.Sc. BZC	8	8	9	9	49	83	A
10	S Karthik	1 st B.Sc. BZC	8	7	8	8	48	79	B ⁺
11	V Mounika	1 st B.Sc. BZC	9	8	8	9	50	84	A
12	V Haritha	1 st B.Sc. BZC	9	8	8	9	50	84	A

Course coordinator

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Parvathipuram Manyam Dist.



GOVERNMENT DEGREE COLLEGE PALAKONDA

(Affiliated to Dr BR AMBEDKAR UNIVERSITY, SRIKAKULAM)




Certificate of Appreciation

This is to certify that Sri/ Smt/ kum _____, _____ has successfully completed Certificate course on

“**Tools and Techniques in Recombinant DNA Technology**” conducted by

Department of Zoology from _____ to _____ with _____ %

certificate ID: _____


HOD of Zoology
Govt. Degree College
Palakonda, S.K.V.M. (D.U.)


IQAC
GDC PALAKONDA
Parvathipuram Manyam Dt.


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PALAKONDA



GOVERNMENT DEGREE COLLEGE PALAKONDA

(Affiliated to Dr BR AMBEDKAR UNIVERSITY, SRIKAKULAM)



Certificate of Appreciation

This is to certify that Sri/ Smt/ kum A.Usba Rabi, BSc - BZC,
1st year has successfully completed Certificate course on
"Tools and Techniques in Recombinant DNA Technology" conducted by

Department of Zoology from 01.04.23 to 08.05.23 with 76 %

certificate ID:


HOD of Zoology
Govt. Degree College
Palakonda, S.K.T.M. (D.V.)


IQAC
GDC PALAKONDA
Parvathipuram Manyam Dt.


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