

Prof. Meenal Mishra
Director,

IG/SOS/Bioch./2023
Date: February 9, 2023

Dear Dr. Haritha,

Greetings from IGNOU! I am happy to inform you that your name has been approved by our Vice-chancellor for writing units of **B.Sc. (Hons.) in Biochemistry**. Thank you very much for agreeing to write the following units of the Fifth and Sixth semester 4-credit courses "**GENE EXPRESSION AND REGULATION (BBCCT-123)**" and "**GENETIC ENGINEERING AND BIOTECHNOLOGY (BBCCT-125)**", which are part of the programme, **B.Sc. (Hons.) in Biochemistry**.

BBCCT-123 GENE EXPRESSION AND REGULATION

Unit-9 (Translation I)

Unit-10 (Translation II)

BBCCT-125 GENETIC ENGINEERING AND BIOTECHNOLOGY

Unit-4: Cloning Vectors for Prokaryotes

Unit-10: Expression of cloned genes

While writing the unit, we would like you to please ensure that:

- the content of the material is factually correct and up-to-date;
- the subject matter is pitched at the right level for our UG learners;
- the examples are appropriate, the exercises contextual and the presentation lucid;
- the language used is simple and easy to comprehend;
- there is uniformity in style of presentation; and the units are written in a cogent and coherent manner;
- the unit should not exceed 5000 words;
- the materials are original and written in a manner that copyright issues do not arise.

The University will provide a token honorarium of Rs. 8000/- (Rs. Eight thousands only) per unit. The expenses incurred towards word processing and art work are reimbursed as per the University norms. The copyright of the materials lies with IGNOU.

With your expertise and experience in this area, I am sure you will help us in creating good quality self-learning materials for the students of the course. My colleague, Dr. M. Abdul Kareem, Assistant Professor in Biochemistry, Email: abdul.kareem@ignou.ac.in, Mob: 9717860446 who is coordinating this course, will remain in touch with you.

A reply communicating your acceptance of this work would be appreciated.

With regards,

Yours sincerely,
Meenal Mishra
(Prof. Meenal Mishra)

To,
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AND BIOTECHNOLOGY****BLOCK 1**

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March, 2023**

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BBCCT-125:GENETIC ENGINEERING AND BIOTECHNOLOGY

Dear Learners, Welcome to the core course Genetic Engineering and Biotechnology (BBCCT-125) is being offered in the sixth semester of the B.Sc. (Hons.) Biochemistry programme. The theory course of Genetic Engineering and Biotechnology (BBCCT-125) has a 4 credits weightage and the laboratory course (BBCCL-126) is of 2 credits.

This course consists of 13 units and are arranged into four blocks.

Block 1: This block provides you the basic information related to enzymes and cloning vectors used in the field of genetic engineering and biotechnology. The first unit of this course is dedicated to explain about basics of recombinant DNA technology that include restriction enzymes, DNA manipulating molecules and techniques used for separation of nucleic acids. The remaining three units of this block will emphasise on joining of DNA fragments, vectors for cloning in eukaryotes and prokaryotes.

Block 2: This block describes various gene cloning strategies. This block consists of a total of three units. The first unit explains the methods used in introducing target DNA into the host cell. The next unit describes the selection methods of recombinant cells. The last unit is dedicated to explain the methods of clone identification.

Block 3: This block consists of three units and explains the *in vitro* DNA amplification and sequencing techniques. The first unit emphasises the basics of polymerase chain reaction (PCR) technique and its variants. Unit 9 and 10 are dedicated to understanding DNA sequencing methods along with methods of expression of cloned genes.

Block 4: Being the last block of this course it is mainly designed to explain applications of genetic engineering in biotechnology. It contains three units where the first unit describes various methods of gene manipulation. The second unit of this block is focussed on applications of recombinant DNA technology. The last unit of this block illustrates applications of protein engineering in the field of biotechnology.

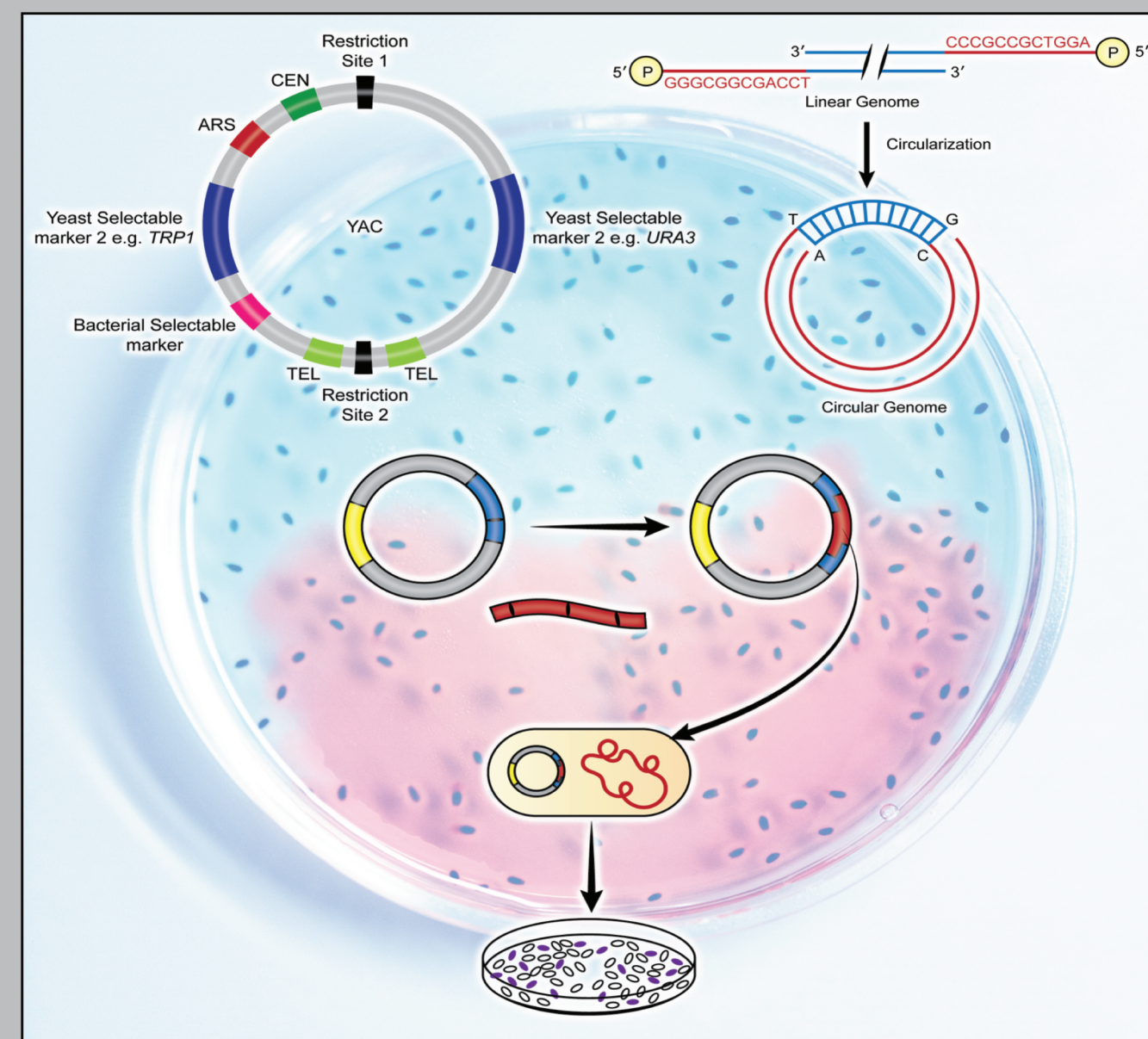
Expected Learning Outcomes:

After studying this course, you should be able to:

- define the important terminology used in biotechnology;
- classify restriction modification enzymes ;
- describe eukaryotic and prokaryotic cloning vectors;
- enlist applications of restriction endonucleases;
- describe gene cloning strategies;
- illustrate transformation technique;
- explain the steps involved in selection for recombinants;
- explain and understand the principle of PCR;

- describe DNA sequencing techniques;
- list the applications of genetic engineering;
- discuss the importance of recombinant DNA technology in medicine; and
- understand the role of protein engineering in pharmaceuticals.

Best regards!



इन्दिरा गांधी

– Indira Gandhi

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