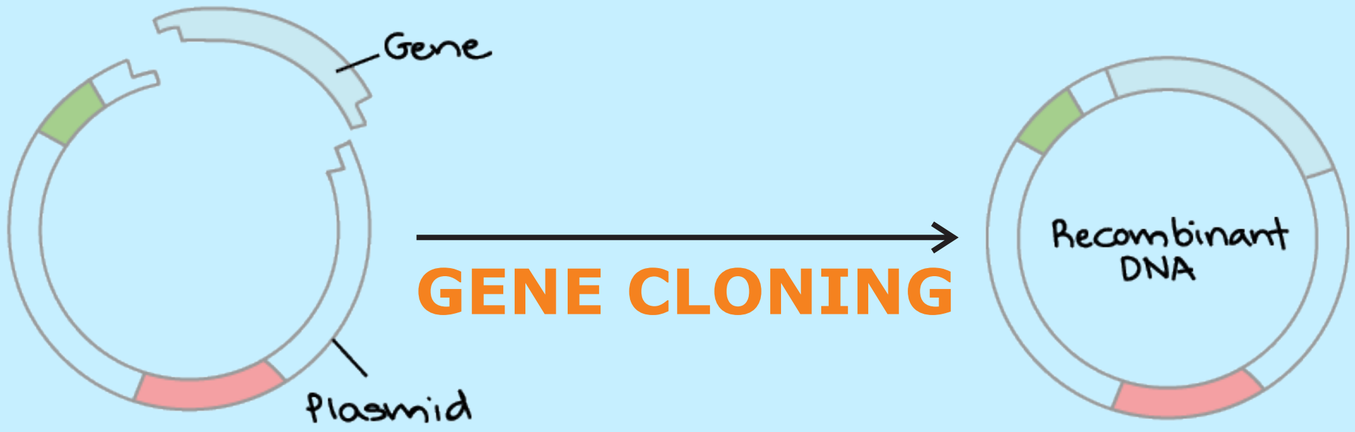
BYJU'S EXAM PREP

MIND MAP

GENE CLONING

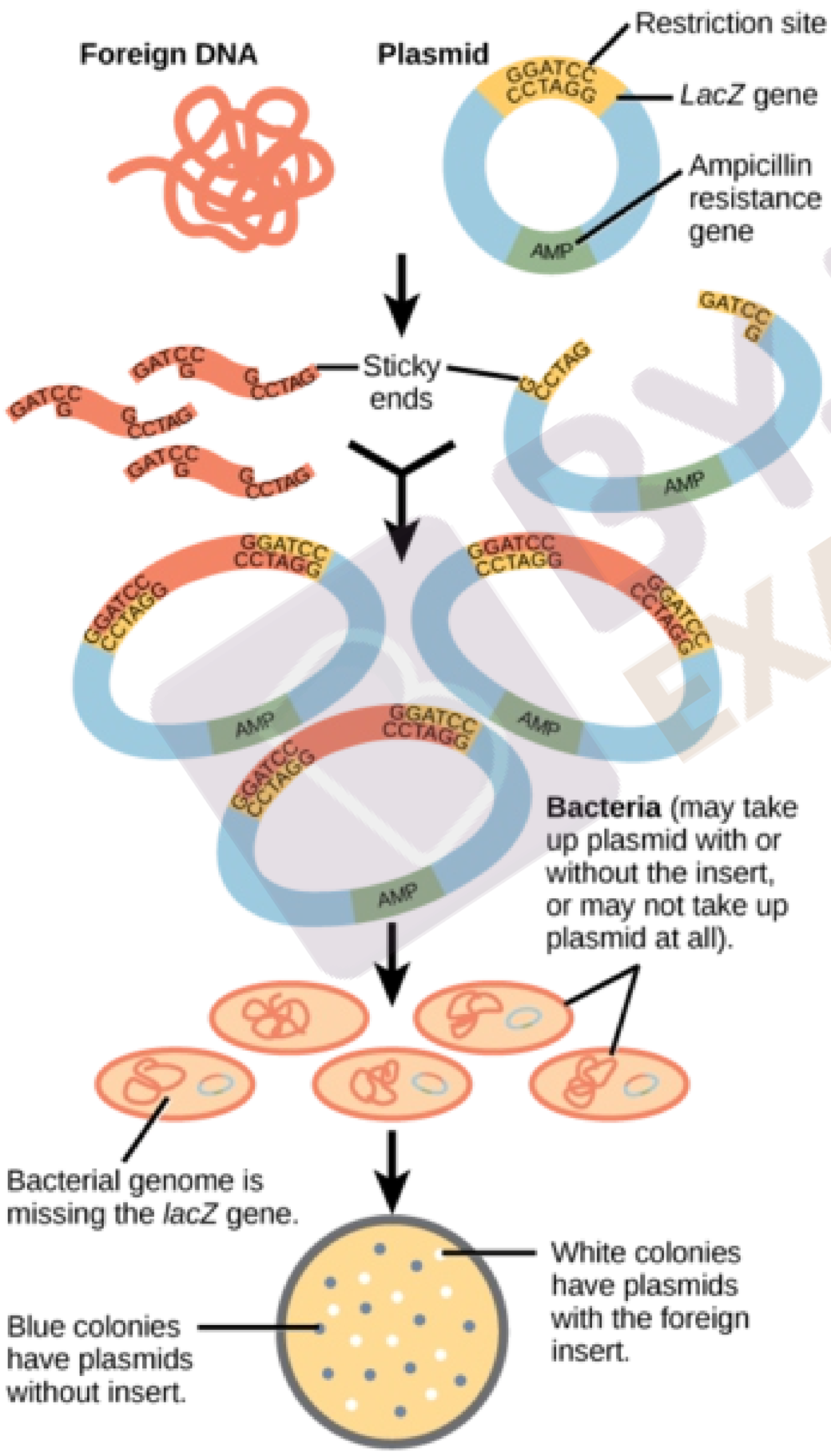


Isolation and amplification of an individual gene sequence by insertion of that sequence by insertion of that sequence into a bacterium where it can be replicated. Involves the construction of a novel DNA molecule, i.e., the product of gene cloning, Recombinant DNA (rDNA).

Components of Gene Cloning

- Enzymes for cutting and joining the DNA fragments
- Vectors (cloning vehicles)
- the DNA fragments (libraries)
- Selection process

BASIC DESIGN OF A GENE CLONING EXPERIMENT

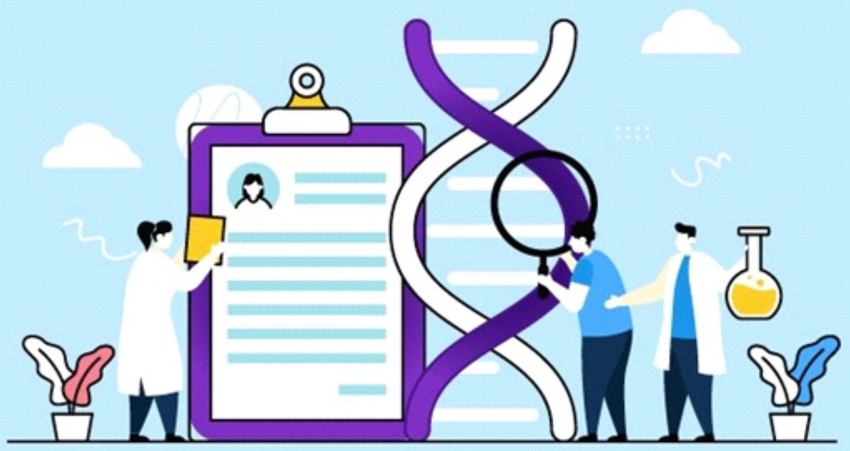


The foreign DNA and plasmid are cut with the same **restriction enzyme**, which recognizes a particular sequence of DNA called a *restriction site*. The restriction site occurs only once in the plasmid, and is located within the *lacZ* gene, a gene necessary for metabolizing lactose.

The restriction enzyme creates sticky ends that allow the foreign DNA and cloning vector to anneal. An enzyme called ligase glues the annealed fragments together.

The ligated cloning vector is transformed into a bacterial host strain that is ampicillin sensitive and is missing the *lacZ* gene from its genome.

Bacteria are grown on media containing ampicillin and X-gal, a chemical that is metabolized by the same pathway as lactose. The ampicillin kills bacteria without plasmid. Plasmids lacking the foreign insert have an intact *lacZ* gene and are able to metabolize X-gal, releasing a dye that turns the colony blue. Plasmids with an insert have a disrupted *lacZ* gene and produce white colonies.



BYJU'S EXAM PREP

CSIR NET Life Science 2022

A Foundation Course

Complete Prep of Life Science for June 2022 Aspirants

Why take this course?

- 400+ Hrs Live Classes & Doubt Sessions for complete conceptual clarity
- 3000+ Practice Questions covering all levels of difficulty
- 20+ Unit Wise Study Modules & Mind Maps
- 50+ Full Mock Tests, Chapter Wise Mock Tests, PYQs Mock Tests