BIOTECHNOLOGY

Biotechnology is the application of biological organisms, systems or process to ~~manufactu~~ for the welfare of human being.

It is the integrated use of biochemistry, microbiology and engineering sciences in order to achieve technological (industrial) application of the capabilities of micro-organisms, cultured tissues, cells and parts thereof.

It is the controlled use of biological agents.

It involves

ELISA → Enzyme linked Immuno Sorbent assay.

→ 1982 → A separate National Biotechnology Board (NBTB) is formed under the department of Science & Technology.

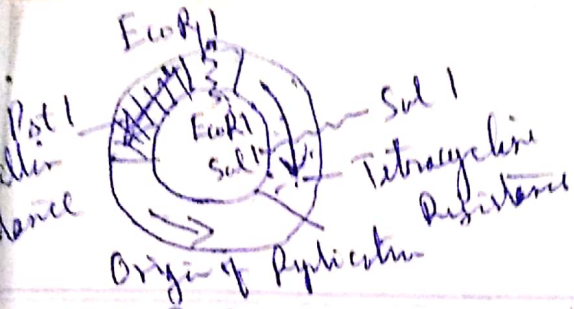
1986 → A separate Biotechnology ® Department under Ministry of Science & Technology

→ International Centre for Genetic Engineering & Biotechnology (ICGEB) for developing countries is established

It has two centres → (i) New Delhi in India → 198
(ii) Trieste in Italy.

⇨ It is operating at
— Indian Agricultural research in
— National Dairy Research Centre, Karnal
— Indian Veterinary Research Institute (IVRI
Izzatnagar

V. L. Chopra Head → 1988 →
f this centre



pBR322 & pBR327. → Naturally occuring plasmids may not possess all the required/essential properties for a suitable cloning vector.

So far one may have to restructure them by inserting genes of relaxed replication or genes for antibiotic resistance. This has actually been done & suitable plasmid vectors have been obtained.

One of the strand cloning vectors widely used in gene cloning expri experiments is pBR322 → Derived from E. coli plasmid Col. E1 → It is 4,362 bp (base pair) DNA.

It is drived by several alternations in earlier cloning vectors (pBR322 is named after Bolivar & Rodriguez who prepared it)

pBR327 is was derived from pBR322 by deletion of nucleotides between 1,427 to 2,516. It They are deleted to reduce the size of the vector and to delete the sequences which ~~are~~ were known to interfere with expression of cloned DNA in eukaryotic cells.

pB327 still contains genes for resistance against two antibiotics (Tetracycline & Propicillin) Both are the very common plasmid vectors.

(2) pUC → plasmids derived from University of California
→ These are 27 bp long and possess
i) Ampicillin resistance gene.

(3) Yeast Plasmid Vectors → Although E coli plasmids or phages can be used for transfer of genes to yeast cells an eukaryotic system, the frequency of transformation is rather low
To overcome this difficulty of frequency of transformation different Yeast plasmid vectors are formed.

(i) YIp or Yeast Integrative Plasmid

Shuttle Vectors → Extensively used in transferring back and forth between Yeast and E. coli cells.

(ii) YEp Yeast Episomal Plasmids
(iii) YRp Yeast Replicating "
(iv) YCp or CEN → Centromere containing Plasmids
(v) pYAC → Yeast artificial chromosome Vector

Retriever vectors → are used to retrieve specific genes from the normal chromosome of an organism like yeast through recombination.

PROBE → Molecular probes are small DNA or R
segments that recognise complementa
sequences in DNA or RNA molecules
and thus allow identification and
isolation of these specific DNA sequ
from an organism.