BIOTECHNOLOGY

TOPIC- BRANCHES OF BIOTECHNOLOGY

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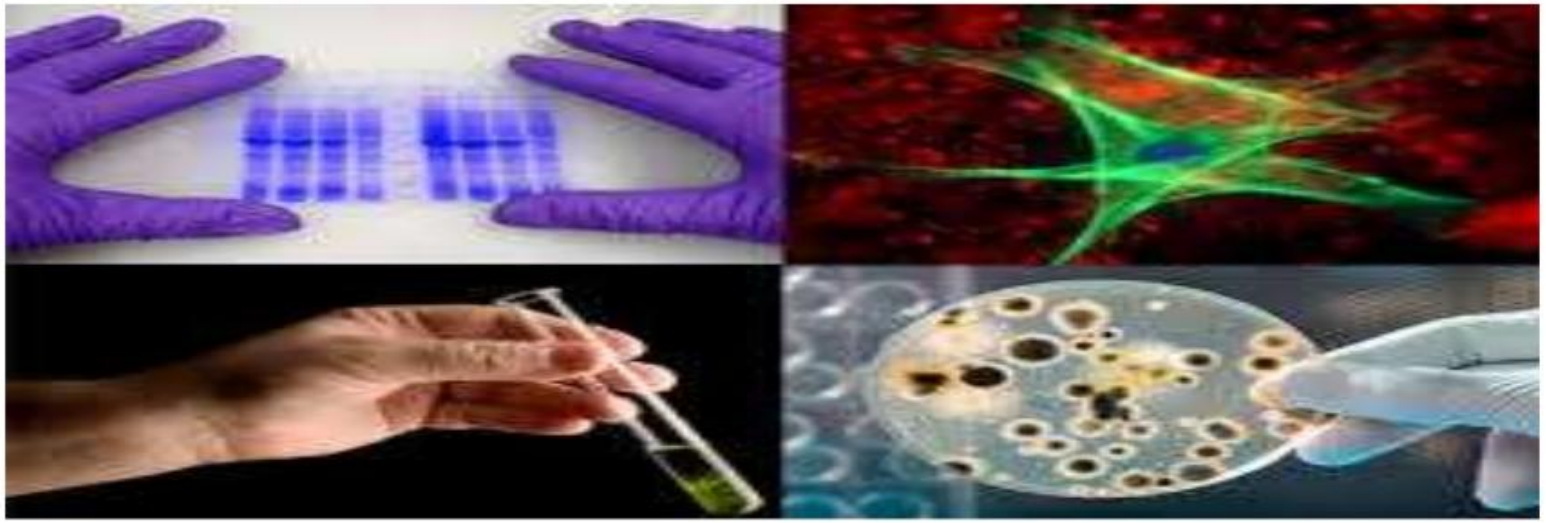
BRANCHES OF BIOTECHNOLOGY

WHAT IS BIOTECHNOLOGY?

- DEFINITION:

The use of living organism to make useful products/things for the benefit of mankind is called biotechnology.



Branches of Biotechnology

- **A) Blue Biotechnology:**
- This branch of biotechnology helps to control the marine organisms and water borne organisms.
- It is a process which has to do with marine or underwater environment. The use of this biotechnology is very rare. Blue biotechnology is used to protect the marine organisms from harmful diseases underwater.

- **B) Bioinformatics** is the combination of computer and biotechnology.

- It helps in finding the analysis of datas related to Biotechnology.

- It is used for various purposes like drugs, for the development of medicines; it is also used to improve the fertility of crops and plants and also for pest, drought and it is resistance to diseases.

- It plays an important and a vital role in areas like Functional genomics, structural genomics and proteomics these areas contribute a lot and become a key contributor to Biotechnology and pharma sector.

- **<u>C) Green Biotechnology:</u>**
- Green Biotechnology is the term used for the **agricultural sector.**
- With the help of the process called the Micropropagation (a practice of producing larger number of plants through the existing stock of plants) which helps in selecting the right quality of plants and crops.

- Also with the help of Transgenic plants (plants whose DNA is modified); this design of transgenic plants helps to grow in a specified environment with the help of certain chemicals.

MEDICAL BIOTECHNOLOGY

- Medical Biotechnology is the use of living cells and cell material to research and produce pharmaceuticals (like enzyme , antibiotic ,vaccine etc) that help to treat and prevent human diseases.

  Some Uses: DNA fingerprinting, Gene Therapy etc .

- **<u>D) Red Biotechnology:</u>**
- Red biotechnology is referred to **as Medical Biotechnology.**

- It is used for the production of drugs and antibiotic medicines. It also helps to create or design organisms.

- Through the process of genetic manipulation it helps to cure genetic issues in organisms.

- It also helps in analysing diseases in organisms.

- It also helps in developing new ways of diagnosis by performing tests.

- With the help of stem cell therapy it helps the organs to grow and it also cures the damaged issues in organisms.

- It deals with diagnosis of various diseases; large scale production of various drugs and hormones such as human insulin and interferon; vaccines for chicken pox, rabies, polio etc.; and growth hormones such as bovine.

INDUSTRIAL BIOTECHNOLOGY

- Industrial biotechnology is a set of practices that use living cells (such as bacteria ,yeast ,algae) or component of cells like enzymes , to generate industrial products and processes.
- Apply technology to improve food technology.
- Role in beverage industry.
- Development of new processes for higher production.

- **White Biotechnology:**
- White Biotechnology is also called and known by the name **Industry Biotechnology**.
- This kind of biotechnology is used and applied in industries and its processes.

- It deals with commercial production of various useful organic substances such as acetic acid, citric acid, acetone, glycerine, etc., and antibiotics like penicillin, streptomycin, mitomycin, etc. through the use of microorganisms especially fungi and bacteria.

- The various uses of this Biotechnology includes; biopolymers (Plastics) Substitutes, new invention of vehicle parts and fuels for the vehicles, invention of fibres for the clothing industry, it is also involved in developing new chemicals and the production process.

ANIMAL BIOTECHNOLOGY

- Animal Biotechnology is a branch of biotechnology in which molecular biology techniques are used to genetically engineer animals in order to improve their suitability for pharmaceuticals ,agricultural or industrial applications.

- **Animal Biotechnology:**
- It deals with development of transgenic animals for increased milk or meat production with resistance to various diseases.
- It also deals with in vitro fertilization and transfer of embryo in animals including man.

FOOD BIOTECHNOLOGY

- Biotech food is grown from seeds that carry specific genes to produce desired characteristics.
- The first biotech food on the market, in the early 1990's , was a tomato that ripened on the vine and could be transported without bruising.

- **Environmental Biotechnology:**
- It deals with detoxification of waste and industrial effluents, treatment of sewage water, and control of plant diseases and insects through the use of biological agents such as viruses, bacteria, fungi, etc.

PLANTS BIOTECHNOLOGY

- Plant Biotechnology is a scientific technique that adapts plants for specific purposes by cross-breeding ,extending their growing seasons etc.

  Plants Biotechnology can be used for:
- fruit development
- vaccine production
- increase nutritional quality etc.

- **Plant Biotechnology:**
- Plant biotechnology is a combination of tissue culture and genetic engineering. It deals with development of transgenic plants with resistance to biotic and abiotic stresses; development of haploids, embryo rescue, clonal multiplication, cryopreservation, etc.

main features of plant biotechnology

- **i. Plant biotechnology consists of the application of two basic techniques,**
- (a) Tissue culture, and
- (b) Recombinant DNA technology or genetic engineering.

- It makes distant crosses (interspecific and inter generic) practically feasible.

- It helps in the development of transgenic plants (plants with foreign DNA) with resistance to biotic stresses.