SCOPE AND APPLICATION OF BIOTECHNOLOGY

This age is known for two important technology: Information technology and Biotechnology. Our Chief Minister Shri Narendrabhai Modi says:

IT + BT = BT (That is **Information technology + Biotechnology** is equal to **BETTER TOMORROW.)** **Biotechnology is the use of biological principles for the production of goods and services which may be** defined **as a very broad field which encompasses manipulations of living organisms themselves or the products that they make or the processes they carry out.**

KEY ELEMENT OF BIOTECHNOLOGY and GENETIC ENGINEERING uses Recombinant DNA Methods to move a Gene from any organism to any other organism. There are many applications of Biotechnology in the fields of Industrial Sector, Agriculture, Pharmaceuticals, Health Care, Food, Energy, Environment spheres etc.

Applications of Biotechnology:

Agriculture is production of transgenic animals and plants with better resistance to pesticides (Bt toxin) and herbicide resistance. It is used for nitrogen-fixation, for amino acid synthesis and utilization and for longer shelf-life of fruits.

In Industrial applications, it is used for production of proteins, enzymes, antibiotics and metabolites used in many processes.

There are many uses in Environmental biotechnology such as generating microbes and plants for bioremediation.

The major benefits are expected in medical, pharmaceutical and health sciences:

In Medical sciences, it is used for production of antibiotics, insulin, growth hormone, interferon, clotting factor VIII, vaccines, probes for infectious and gene therapy and so on.

Major break through in Medical Science through rDNA Technology:

- **Insulin (a hormone used to control diabetes) is produced in bacteria**
- **Erythropoietin (used to treat anemia by stimulating red blood cell production)**
- **Human growth hormone (somatotropin; used to treat growth deficiencies);**
- **Factor VIII (used to treat hemophilia);**
- **Interferons (used against certain cancers and viral infections**

- **Interleukin-2 (used as an immune enhancer and in adoptive immunotherapy);**
- **Tissue plasminogen activator (dissolves blood clots);**
- **Epidermal growth factor (help heal wounds, burns, and ulcers);**
- **Pro-urokinase (an anticoagulant used to treat heart attack);**
- **Vaccine production.**

One can make Careers in Biotechnology in the following areas:

- **Agriculture and Environmental Biotechnology**
- **Health Sciences and Pharmaceutical science**
- **Forensics and Reproductive Biology**
- **Food and Dairy biotechnology**
- **Patent attorney**
- **Clinical research**
- **Drug regulatory affairs**
- **Good Manufacturing Practices (GMP) and Good Laboratory Practices (GLP)**
- **Drug designing and new delivery systems**
- **Nano biotechnology and their applications**
- **Environment protection and conservation through biotechnology**
- **Regulatory and Legal laws**
- **Diagnostics**
- **Academics in college and university and**
- **Career as Scientist**

Special Features at AMCOST:

1. All the infrastructural facilities available with Gradient PCR, Gel documentation system, Electrophoresis units, BODs, and all other instruments for Biotechnology curriculum
2. Personal attention for career counseling.
3. Guest lectures from eminent scientists.
4. Industrial training and campus placements
5. Dissertation facility: in-house and outside
6. All Practicals are performed by individual students.

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