



ATOMIC ENERGY CENTRAL SCHOOL 4

MUMBAI

UNIT IX

CHAPTER 12

BIOTEHNOLOGY AND ITS APPLICATION

SYNOPSIS

MODULE – 3/3

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TOPICS TO BE COVERED

- **TRANSGENIC ANIMALS**

- **ETHICAL ISSUES**

Transgenic Animals

- The animals with their DNA manipulated which possess and express foreign gene are known as Transgenic Animals.
- There are many transgenic animals like: rats, rabbits, cows, sheep and fish.
- These animals are beneficial to mankind in the following ways:

- **Normal physiology and development:** Specifically designed to study gene regulation
- **Study of disease:** Specially designed to serve as models to investigate new treatment for diseases
- **Biological products:** Produce useful biological products by introduction of part of DNA
- **Vaccine safety:** To test the safety of vaccine before used on humans
- **Chemical safety testing:** Also known as toxicity testing. They are more sensitive to toxins, when exposed, to study their effects

Ethical Issues

Ethics includes rules of conduct by which a community regulates its behavior and decides as to which activity is lawful and which is not.

Bioethical concerns pertaining to biotechnology are briefly mentioned below:

- Introduction of a transgene from one species into another species violates the ‘integrity of species’.
- Biotechnology may pose unforeseen risks to the environment, including risk to biodiversity.

- Transfer of human genes into animals and vice-versa dilutes the concept of humanness.
- When animals are used for the production of the pharmaceutical proteins, they are virtually reduced to the status of a factory.
- Use of animals in the field of biotechnology causes great suffering to them.
- Biotechnology is disrespectful to living beings and only exploits them for the benefit of human beings.

Thus Indian Government has set up organization such as GEAC(Genetic

Engineering Approval Committee), which decides the validity of GM research and the safety of introducing GM organisms for public services.

Biopatent

A patent is the right granted by a government to an inventor to prevent others from commercial use of his invention. When patents are granted for products derived from them, these patents are called Biopatents.

Biopiracy

Some organizations and multinational companies exploit and /or patent

biological resources of other nations without proper authorization from the countries concerned.

Biowar

War that is fought by bioweapons (biological weapons) against humans their crops and animals. Viruses, bacteria, fungi, spores and toxins can be used as bioweapons.

ACKNOWLEDGEMENT

The following text books were referred to complete the synopsis:

- 1. Text book of NCERT Class – XII
- 2. Truman's Elementary Biology Part – 2
- 3. MT Biology Today
- 4. MTG at your fingertips
- 5. Wikipedia