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CHAPTER

UNIT - IV

Applications of Biotechnology



"Our world is built on biology"

Chapter outline

- 10.1 Applications in Medicine
- 10.2 Gene therapy
- 10.3 Stem Cell Therapy
- 10.4 Molecular Diagnostics
- 10.5 Transgenic Animals
- 10.6 Biological products and their uses
- 10.7 Animal cloning
- 10.8 Ethical issues
- 10.9 Regulation in biotechnology
- 10.10 Possible threats of Genetically Modified Organisms
- 10.11 Biosafety guidelines



Learning objectives

- Understand the applications of rDNA technology in the field of medicine.
- Analyse the role of diagnostic tools in Molecular diagnosis.
- Learn animal cloning and its applications.
- Create awareness on the ethical issues involved in biotechnology.
- Realise the need for biosafety guidelines and regulations in Biotechnology.



Before we start this chapter, it will be helpful if you revise the structure of DNA, Protein synthesis and genetic engineering. Genetic engineering involves the manipulation of DNA and naturally occurring processes such as protein synthesis for a wide range of applications including the production of therapeutically important proteins. This also involves extracting a gene from one organism and transferring it to the DNA of another organism, of the same or another species. The DNA produced in this way is referred to as recombinant DNA (rDNA) and this technique as recombinant DNA technology. All these are part of the broad field biotechnology which can be defined as the applications of scientific and engineering principles to the processing of material by biological agents to provide goods and services.

Biotechnology is an umbrella term that covers various techniques for using the properties of living things to make products or provide services. The term biotechnology was first used before 20th century for such traditional activities as making idli, dosa, dairy products, bread or wine, but none of these would be considered biotechnology in the modern sense.

In this chapter we will study the applications of bio-technology in various fields including the field of Medicine. Recombinant DNA technology has led to the large scale production of various hormones and proteins of therapeutic use.