

CHAPTER 12



BIOTECHNOLOGY AND ITS APPLICATIONS

12.1 *Biotechnological Applications in Agriculture*

12.2 *Biotechnological Applications in Medicine*

12.3 *Transgenic Animals*

12.4 *Ethical Issues*

Biotechnology, as you would have learnt from the previous chapter, essentially deals with industrial scale production of biopharmaceuticals and biologicals using genetically modified microbes, fungi, plants and animals. The applications of biotechnology include therapeutics, diagnostics, genetically modified crops for agriculture, processed food, bioremediation, waste treatment, and energy production. Three critical research areas of biotechnology are:

- (i) Providing the best catalyst in the form of improved organism usually a microbe or pure enzyme.
- (ii) Creating optimal conditions through engineering for a catalyst to act, and
- (iii) Downstream processing technologies to purify the protein/organic compound.

Let us now learn how human beings have used biotechnology to improve the quality of human life, especially in the field of food production and health.

12.1 BIOTECHNOLOGICAL APPLICATIONS IN AGRICULTURE

Let us take a look at the three options that can be thought for increasing food production

- (i) agro-chemical based agriculture;