



Principles and Processes of Biotechnology



Learning Objectives

The learner will be able to

- ❖ Apply the knowledge of traditional and modern biotechnology in day to day life.
- ❖ Appreciate the uses of fermentation process.
- ❖ Acquire the knowledge on the process of genetic engineering
- ❖ Analyse the uses and limitations of genetically modified plants
- ❖ Cognize the terms of bio prospecting and bio piracy.



Chapter outline

- 4.1 Development of Biotechnology
- 4.2 Methods of Biotechnology
- 4.3 Advancements in Modern Biotechnology
- 4.4 Tools for Genetic Engineering
- 4.5 Methods of Gene transfer
- 4.6 Screening for Recombinants
- 4.7 Transgenic Plants / Genetically Modified Crops
- 4.8 Applications of Biotechnology.

Biotechnology is the science of applied biological processes. In other words it is science of development and utilization of biological processes, forms and systems for the benefit of mankind and other life



Figure 4.1
Karl Ereky

forms. The term biotechnology was coined by Karl Ereky, a Hungarian Engineer in 1919 and has been extended to include any process in which organisms, tissues, cells, organelles or isolated molecules such as enzymes are used to convert biological or other raw materials to products of greater value.

4.1 Development of Biotechnology

Biotechnology has developed by leaps and bounds during the past century and its development can be well understood under two main heads namely **conventional or traditional biotechnology** and **modern biotechnology**

1. Conventional or traditional biotechnology: This is the kitchen technology developed by our ancestors, and is as old as human civilization. It uses bacteria and other microbes for preparation of dairy products like curd, ghee, cheese and in preparation of foods like idli, dosa, nan, bread and pizza. This conventional biotechnology also extends to preparation of alcoholic beverages like beer, wine, etc.

With the advancement of the science and technology during the 18th century, these kitchen technologies gained scientific validation.