

Pharmaceutical Biotechnology

Biotechnology - Definition

The term biotechnology was coined in 1917, by Hungarian engineer, Karl Ereky, to describe a process for large scale production of pigs. Biotechnology can be defined as application of technology Using the living organisms to obtain useful products.

Available Definitions :

- Biotechnology is the application of biological organisms systems or process to manufacturing and service industries (British biotechnologists)
- Biotechnology is integrated use of biochemistry, microbiology and engineering sciences in order to achieve technological applications of microbes, cultured cells and parts there of (European federation of biotechnologist)
- Biotechnology is the controlled use of biological agents, such as microbes or cellular components. (U.S.National science foundation)

WHAT IS BIOTECHNOLOGY ?

In 1919, Karl Ereky, a Hungarian engineer, coined the term biotechnology for the first time to describe the interaction of biology and human technology.

Bio: the use of biological processes, and technology: to solve problems or make useful products = biotechnology.

Biotechnology is the use of living systems and organisms to develop or make useful products. Or its any technological application that uses biological systems, living organisms or derivatives, thereof, to make or modify products or processes for specific use.

Stages of biotechnology

❖ Stage I : Pre- Pasteur Era (before 1885)

- Discovering of microorganisms
- Traditional microbial industry(bread, cheese, beer and wine)

❖ Stage II : Pasteur Era or Fermentation Era (1885 – 1940)

- Production of gunpowder by soil microorganisms
- The fermentative ability of microorganisms
- Production of chemicals like acetone, butanol, ethanol and organic acids

Stage III : Antibiotics Era (1940 -1960)•

- Production of antibiotics
- Production of enzymes and vitamins
- Production of gibberellins ,amino acids, nucleotides and steroids
- Tissue cultures techniques

❖ **Stage IV : Post antibiotics Era (1960 -1975)**

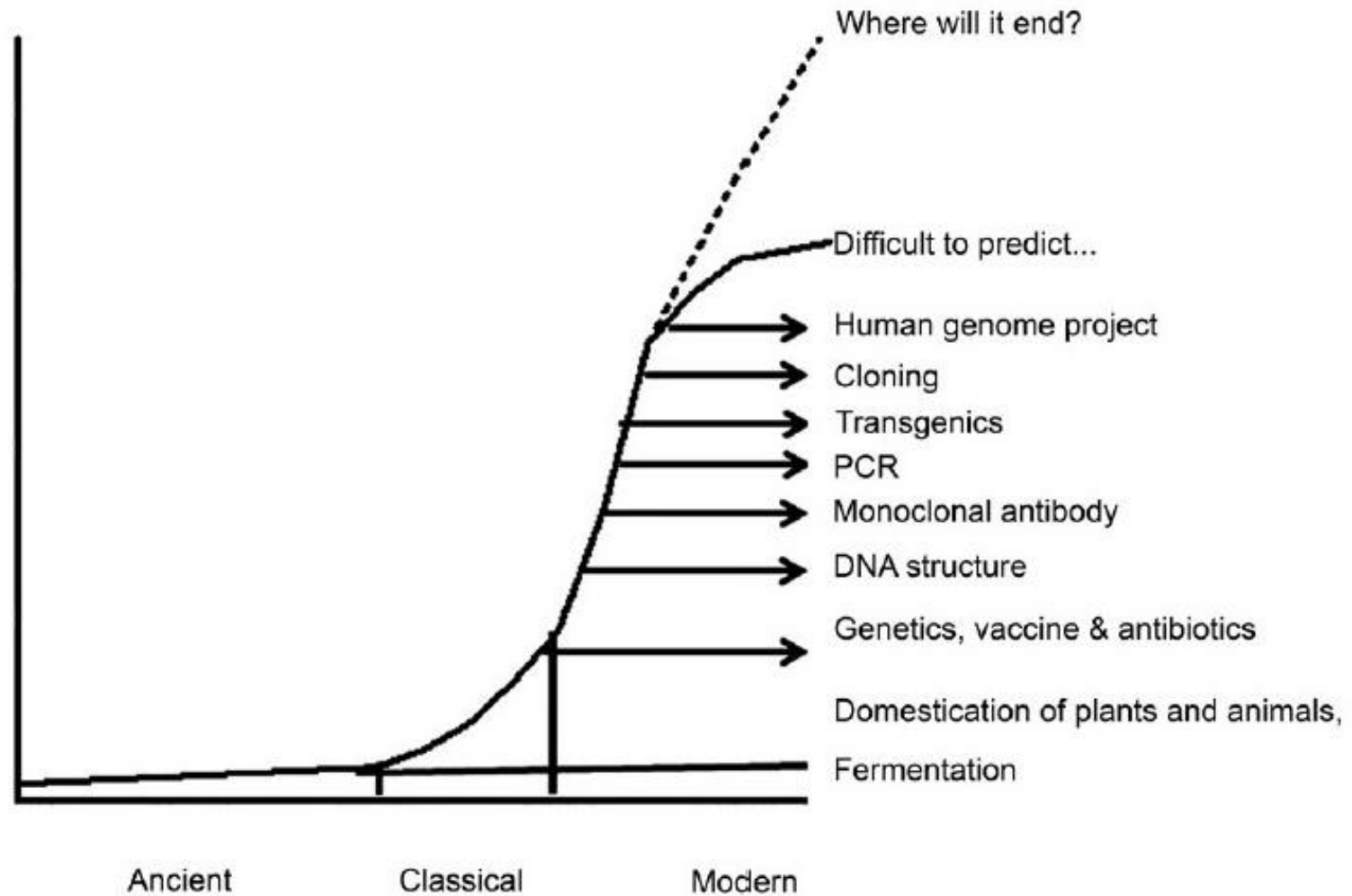
- Production of single cell protein (SCP)
- Production of sterilants and disinfectants
- Enhancement of microorganisms productivity by genetic engineering techniques

❖ **Stage V : Genetic engineering Era (1975 - 2000)**

- Production of therapeutic proteins (insulin, interferon,....etc)
- Production of new sources of energy (Biogas and biodiesel)
- Production of monoclonal antibodies
- Production of hybrid antibodies
- Production of biodetergents
- Immobilization of enzymes and cells

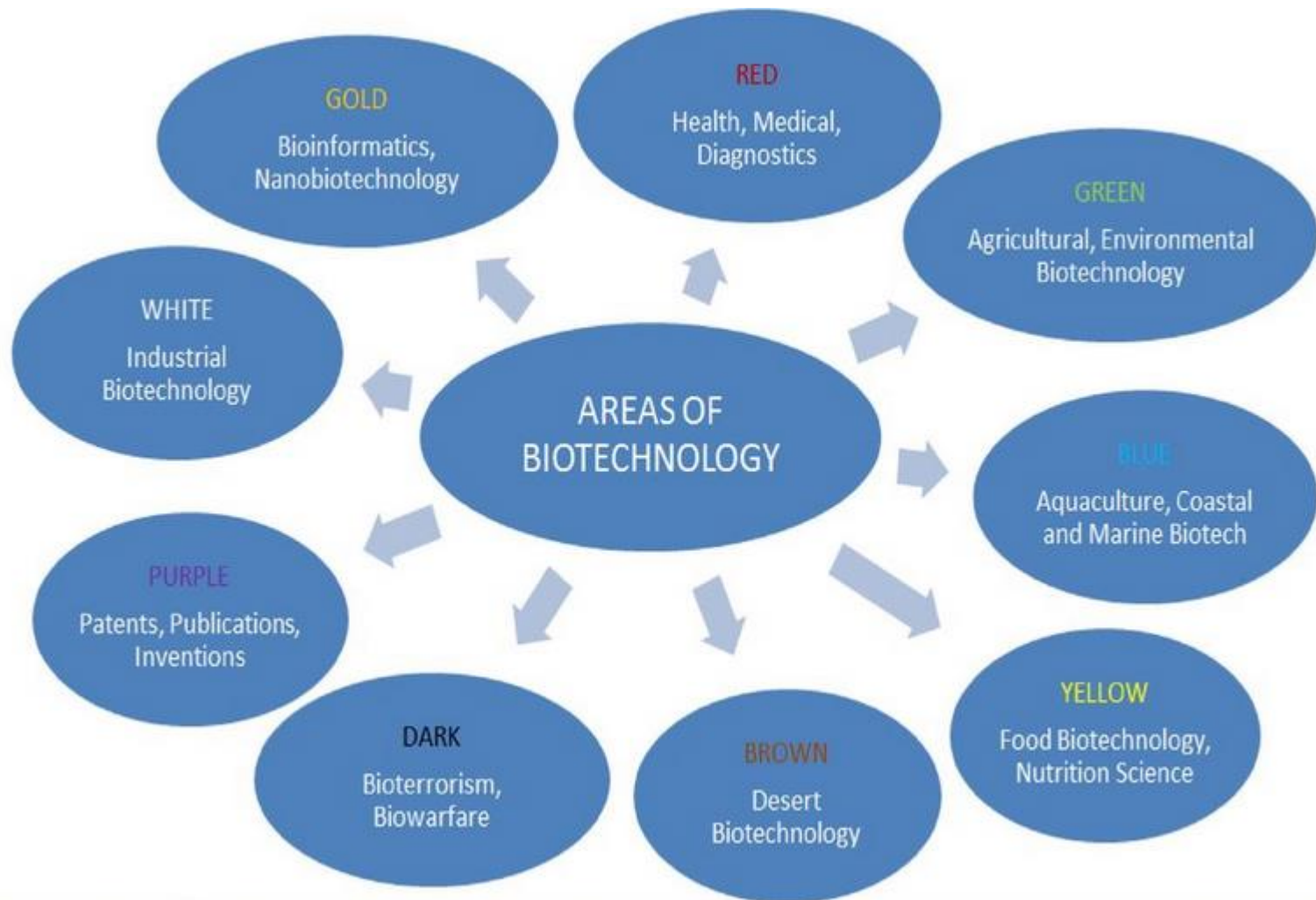
❖ **Stage VI : Era of transgenic organisms (2000 - 2025)**

- Production of vaccines by plants
 - Production of therapeutic proteins by animals
- Production of genetically modified foods.
- Production of artificial chromosomes

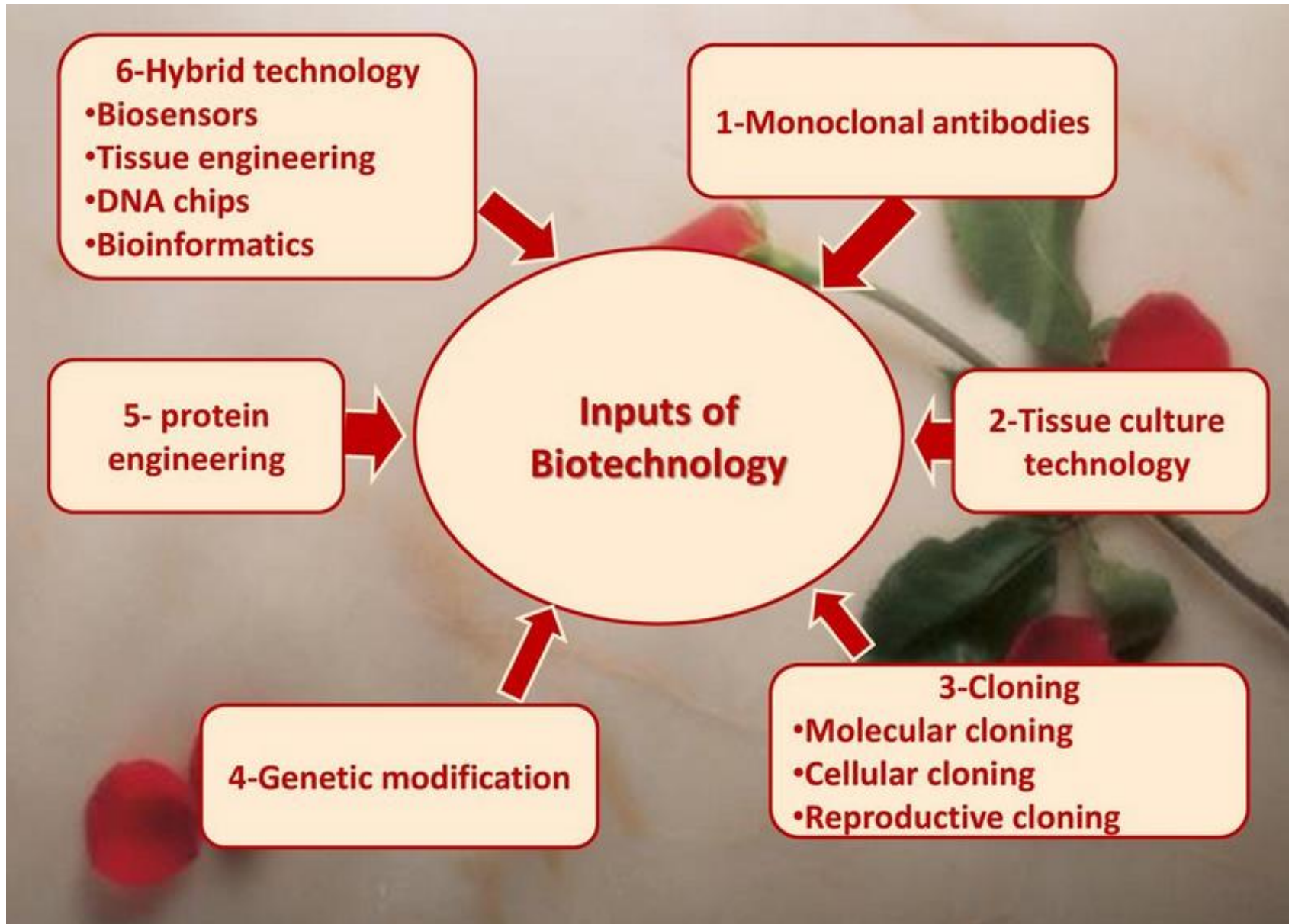


History of the development of biotechnology. Some of the important biotechnology discoveries have been plotted in this graph, with a possibility for its unlimited growth in the future

Generations of Biotechnology



RED ; Pharmaceutical Biotechnology



Pharmaceutical Biotechnology

- Pharmaceutical Biotechnology consist of the combination of two branches;

“Pharmaceutical Science” + “Biotechnology”

Pharmaceutical Technology; Can simply be define as the branch of science that deals with the formulation compounding and dispensing of drugs.

Biotechnology; Can simply be defines as the aplication of biological system, living organisms, or their derivatives in making or modifying products or processes for specific use.

Briefly;

- **Pharmaceutical Biotechnology**: Can simply be define as the science that covers all technologies required for the production, manufacturing and registration of biological drugs.
- The aim of this pharmaceutical biotechnology is to design, produce drugs that are adapted to each persons genetic make up, which can give the maximum therapeutic effect. Biotechnology plays an important role in pharmaceutical science most especially in the pharmaceutical industries by creation of genetically modified organisms that can be used in industrial production.