

Applications of Biotechnology

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SC1172: Introduction to Information Technology

What is Biotechnology ?

Biotechnology refers to the **use of living systems** (biological matter) to **develop products through a process**

Karl Ereky (October 20, 1878 –June 17, 1952) was a Hungarian agricultural engineer. The term 'biotechnology' was coined by him in **1919**.

Karl Ereky is regarded as the
“Father of biotechnology”.



Areas of Biotechnology

Biotechnology Rainbow

Blue	Marine Biotechnology
Brown	Desert Biotechnology
Dark	Bioterrorism
Gold	Bioinformatics
Green	Agricultural Biotechnology
Grey	Classic Biotechnology
Purple	Patents, IPR
Red	Medical Biotechnology
White	Industrial Biotechnology
Yellow	Nutritional Biotechnology

Biotechnology **RAINBOW** Written by **Phyllis Dumas** in June 2010

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01. **Marine Biotechnology** Efforts that involve the marine resources of the world, either as the source or target of the biotechnology applications.
Ex: **Aquaculture, Transgenic Fish, Freeze Resistant Fish**
02. **Desert Biotechnology** New biotechnology developments in arid and desert countries.
Ex: **Eco-Barrels, Green dots, Shade Balls**
03. **Bioterrorism** Focus on detecting and counteracting biological weapon threats.
Ex: **Micro-fluidic technology, DNA-based microorganism identification**
04. **Bioinformatics** Use of computer technology to manage biological information.
Ex: **Drug Discovery, Biofuels, Preventive Medicine**
05. **Agricultural Biotechnology** Uses various tools to improve plants, animals & microorganisms.
Ex: **Molecular Breeding, Plant & Animal Reproduction, Micro-propagation**

06. Classic Biotechnology techniques to alter the genetic makeup (genotype) of microorganisms, plants and animals for the purpose of changing their physical characteristics (phenotype).

Ex: **Fermentation, Selective Breeding**

07. Patents, IPR Focuses on protection of rights and ownership of discoveries.

Ex: **Patents, Trademarks, Copyright**

08. Medical Biotechnology Includes the creation of new vaccines, nutraceuticals, cosmetics with active biological ingredients, and medicines from transgenic animals and plants.

Ex: **Edible Vaccines, Pharmacology, Diagnosis**

09. Industrial Biotechnology Gene-based biotechnology Environmentally- friendly production and processing of chemicals, pharmaceuticals, materials, and bio- energy.

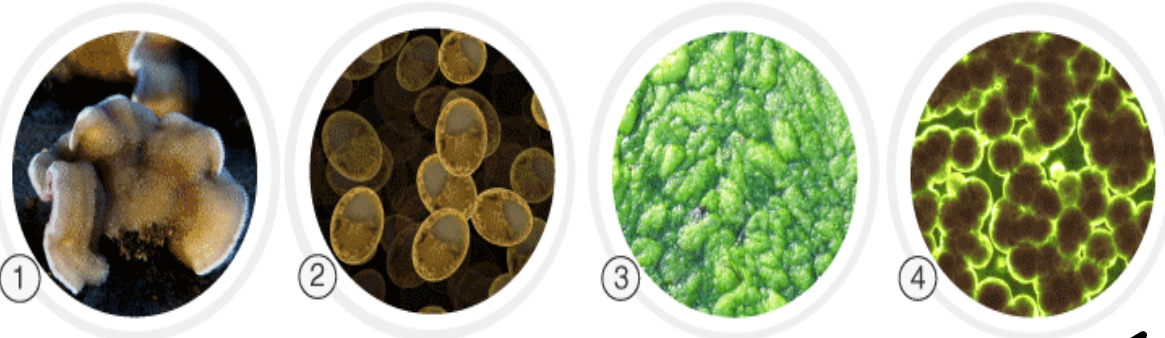
Ex: **Food Enzymes, Waste Recycling, Water Purification**

10. Nutritional Biotechnology Focuses on the composition of crops and other foods.

Ex: **Golden Rice, Super Corn, Hybrid Foods**

Some Examples for Application of Biotechnology

MICROORGANISMS USED FOR THE PRODUCTION OF SCP



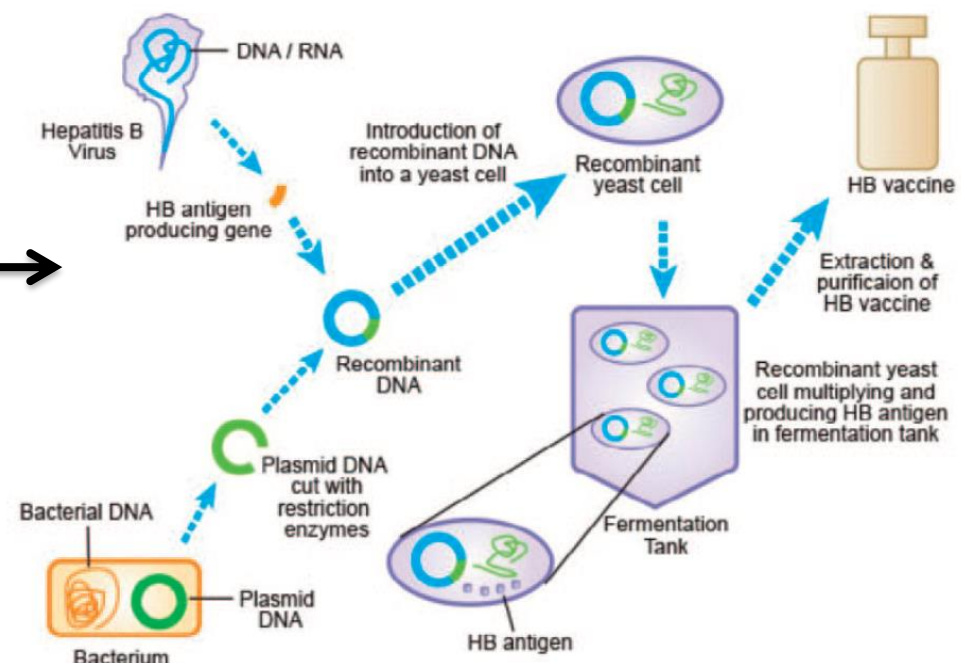
1 Fungi | 2 Yeast | 3 Algae | 3 Bacteria

Hepatitis B Vaccine

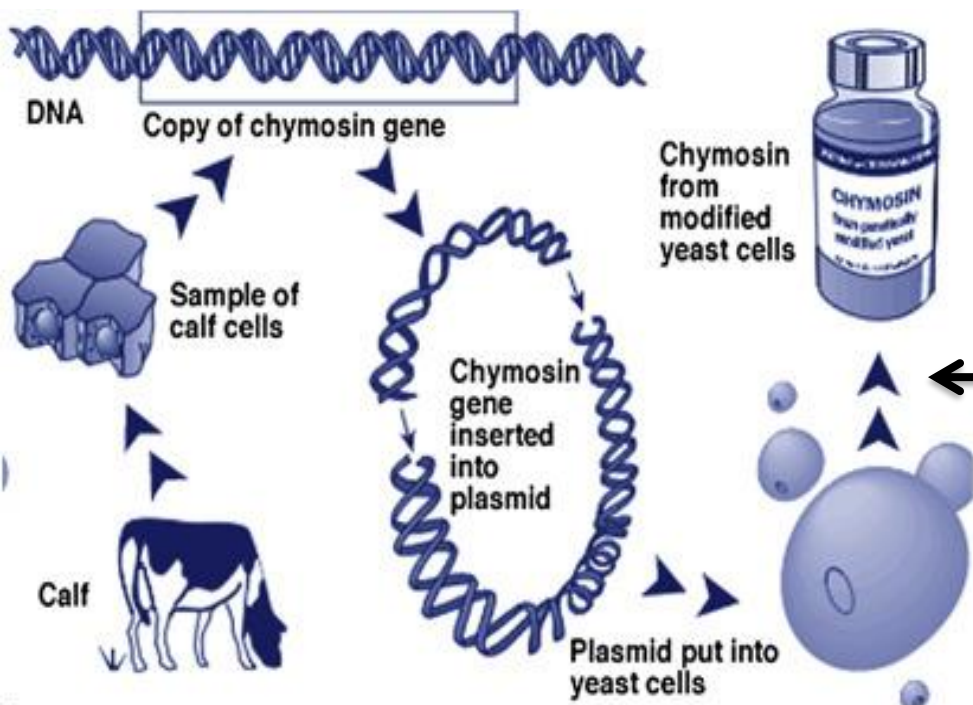
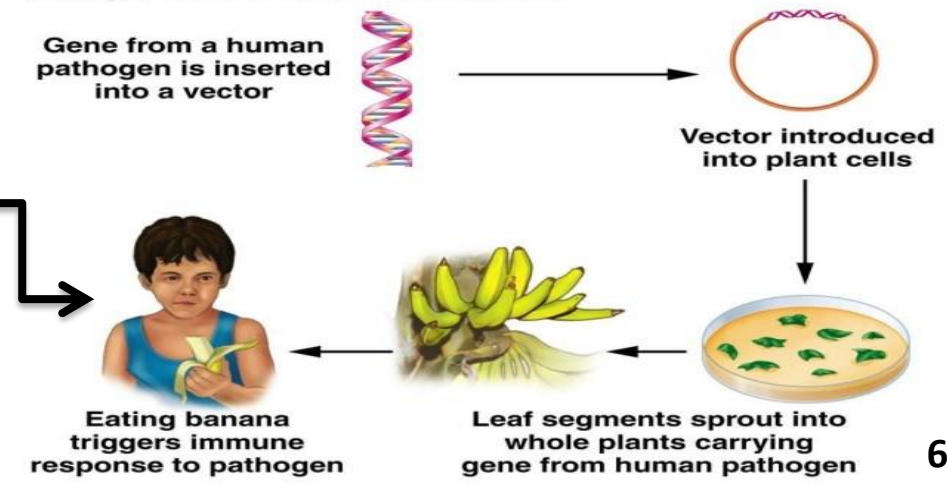
Single Cell Protein (SCP)

Chymosin Enzyme

Edible Vaccine



Recombinant DNA Approaches for Vaccine Production and Transgenic Plants with Edible Vaccines



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THANK
YOU!!!