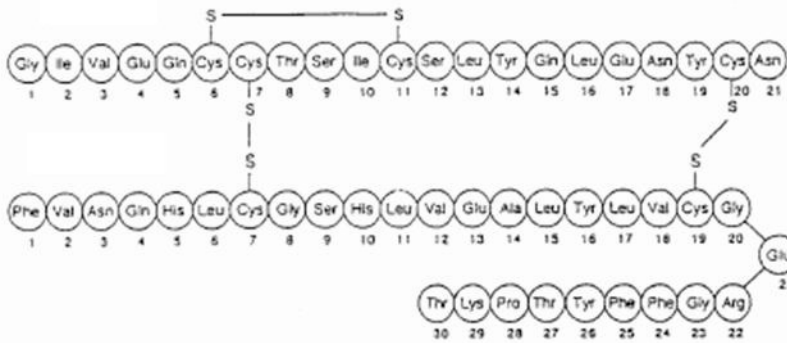


Biotechnology

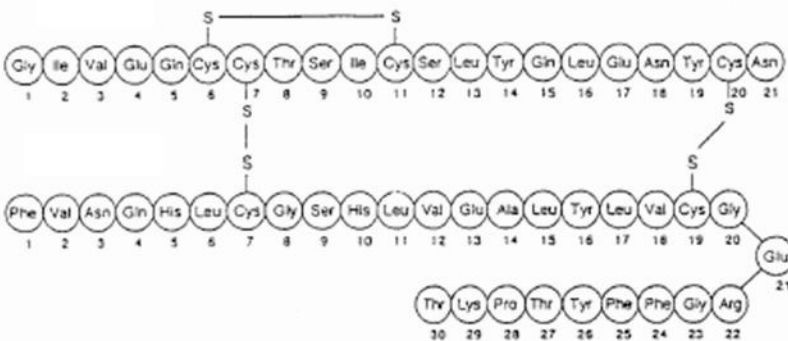
- | | |
|---------------------------|---------------------------|
| Artificial selection | Gene therapy |
| Bioreactor Bioremediation | Polymerase chain reaction |
| Biotechnology | rDNA |
| DNA and mRNA vaccines | Restriction enzyme |
| Gene editing | Semi-synthetic |
| | Transgenic |

Question

1. How did microbial fermentations make food safe to eat?
2. What type of molecule is insulin: carbohydrate, protein, lipid?
3. Differentiate between Human insulin and rHuman insulin.

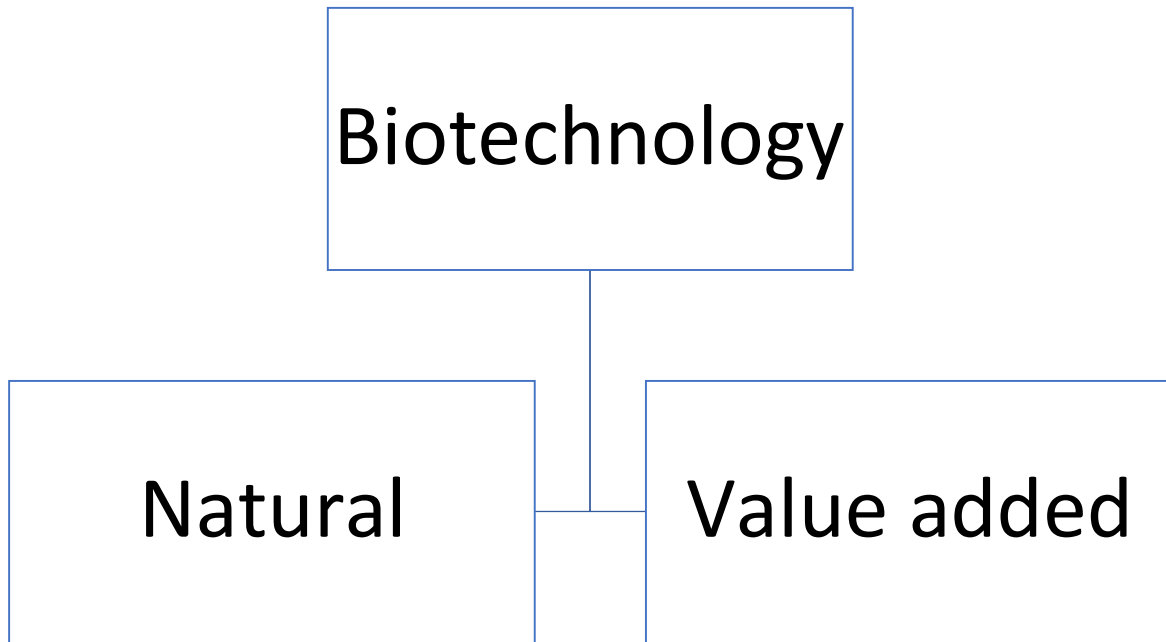


Amino acid sequence of Human insulin.



Amino acid sequence of rHuman insulin.

List at least three examples of natural and value-added biotechnology products



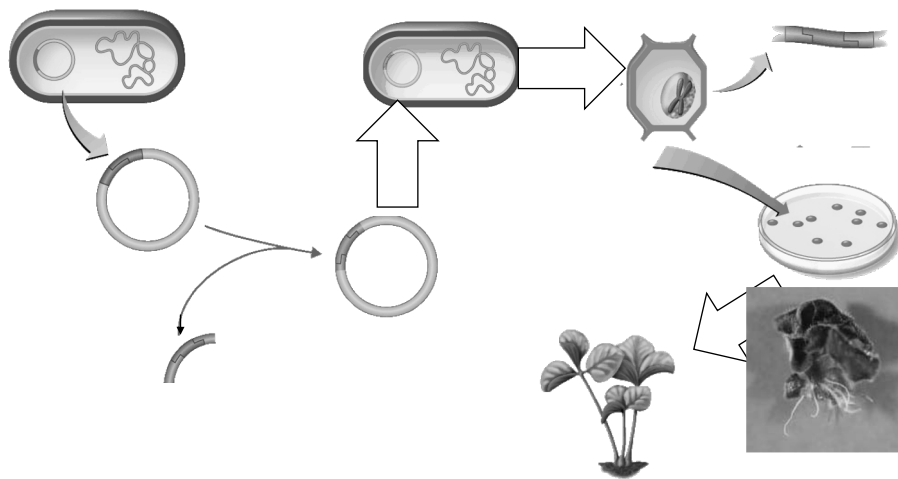
Objectives

The figures are provided to help you take notes. Look for the similarities between the processes.

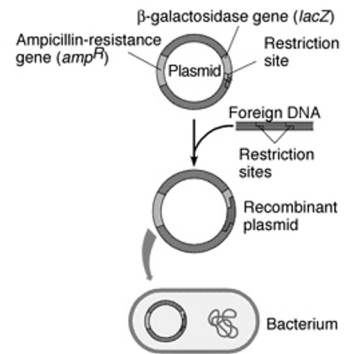
Be able to

1. Summarize each of these processes in one or two sentences.
Do not memorize the steps.
2. Compare (similarities) and contrast (differences) between these processes to artificial selection.
3. Provide an example of genetic modification of each of the following:
 - a plant
 - a bacterium
 - a human

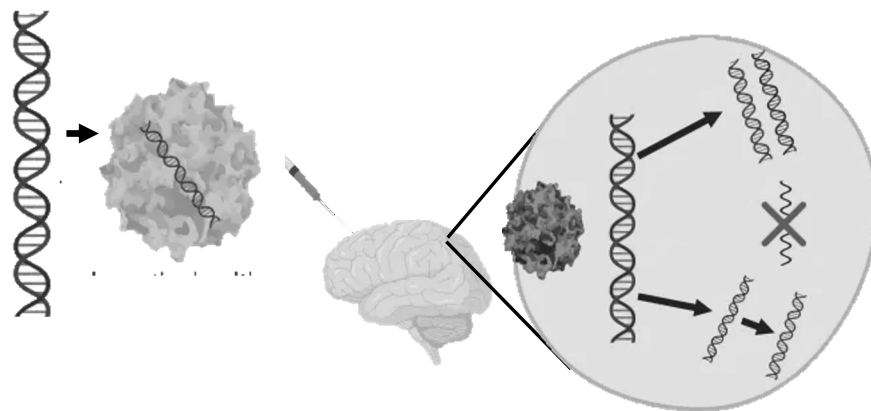
Engineering a plant



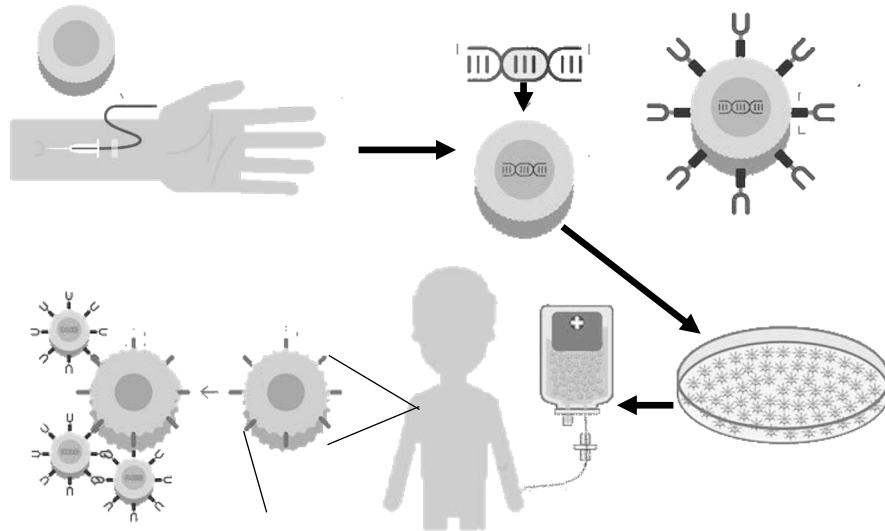
rDNA



Gene Therapy: Virus vector



Gene therapy for cancer



DNA vaccine

