

Insights of Industrial Microbiology

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Description

Industrial microbiology is a branch of biotechnology that applies microbial science to mass produce industrial products, often using microbial cell factories. There are several ways to manipulate microorganisms to increase maximum product yield. The introduction of mutations into living organisms can be achieved by introducing them into mutagens. Another way to increase production is through gene amplification. This is done using plasmids and vectors.

Plasmids and/or vectors are used to integrate multiple copies of a particular gene. This allows more enzymes to be produced and ultimately increases the yield of the product. Manipulation of organisms to obtain a particular product has many uses in the real world, including the production of several antibiotics, vitamins, enzymes, amino acids, solvents, alcohols, and daily necessities. Microorganisms play a major role in industry and can be used in a variety of ways. Medically, microorganisms can be used to make antibiotics to treat antibiotics.

Microbes can also be used in the food industry. Microbes are very useful in making some of the bulk products that humans consume. The chemical industry also uses microorganisms to synthesize amino acids and organic solvents. Microorganisms can also be used in agricultural applications as bio pesticides instead of using harmful chemicals and inoculants to aid plant growth.

Medical uses

The medical use in industrial microbiology is the production of new drugs synthesized in specific organisms for medical purposes. The production of antibiotics is necessary for the treatment of many bacterial infections. Some naturally occurring antibiotics and precursors are made through a process called fermentation. Microorganisms grow in liquid media with a controlled population size for maximum amount of product. In this environment, nutrients,

pH, temperature, and oxygen are also controlled to maximize cell mass and prevent cells from dying before the desired antibiotic is produced. Once an antibiotic is made, it needs to be extracted in order to earn income. Archaea are certain types of prokaryotic microorganisms that have the ability to maintain a population in unusual and usually harsh environments. Those who survive in the most hostile and extreme environments are known as extremophiles.

The isolation and identification of different species of archaea, especially extremophiles, made it possible to analyze their metabolic processes, which were subsequently manipulated and used for industrial purposes. Extremophiles are exposed to extreme climates such as very hot or cold, extremely acidic or basic solutions, or to other harmful factors such as radiation by the enzymes and molecules they produce. It's especially interesting because it can sustain life. Certain enzymes that have been isolated and used for industrial purposes include thermostable DNA polymerases. This type of polymerase is a common tool in molecular biology. It can withstand the high temperatures required to complete the polymerase chain reaction.

Knowledge of industrial microbiology has revolutionized the ability of genetically engineered cells to create new products. Genetic engineering and gene assembly have been developed to improve industrial fermentation. Therefore, biotechnology is a new approach to manufacturing products using living organisms. Bioprocess knowledge was developed to provide high quality products. The application of bioscience in industrial processes is called bioprocessing. Most biological and pharmaceutical products are manufactured on well-defined industrial bioprocesses.

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