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Editorial

Genetic Engineering: An Overview

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EDITORIAL

Genetic engineering, also known as genetic modification or genetic manipulation, is the use of biotechnology to directly manipulate an organism's genes. It refers to a set of techniques for altering the genetic makeup of cells, such as gene transfer within and across species boundaries, in order to create better or novel organisms. New DNA is created by extracting and duplicating the genetic material of interest using recombinant DNA technologies or by synthesizing it chemically.

To introduce this DNA into the host organism, a construct is normally built. Paul Berg created the first recombinant DNA molecule in 1972 by mixing DNA from the monkey virus SV40 with DNA from the lambda virus. The method can also be used to remove genes, or "knock out" genes, in addition to adding them. The new DNA might be introduced at random or to a precise location in the genome. Genetically modified (GM) organisms are organisms that have been created through genetic engineering (GMO). In 1973, Herbert Boyer and Stanley Cohen created the first GMO, a bacteria. When Rudolf Jaenisch put foreign DNA into a mouse in 1974, he developed the first GM animal. Genentech was the first business to focus on genetic engineering, and it began producing human proteins in 1976. Human insulin was genetically modified in 1978, and insulin-producing bacteria were commercialized in 1982.

Since the release of the Flavr Savr tomato in 1994, genetically modified food has been available for purchase. Many sectors, including science, health, industrial biotechnology, and agriculture, have used genetic engineering. GMOs are used in research to explore gene function and expression through experiments such as loss of function, gain of function, tracking, and expression. It is feasible to construct animal model organisms of human diseases by knocking out genes relevant for specific illnesses.

Hereditary engineering offers the potential to heal genetic illnesses through gene therapy, in addition to creating hormones, vaccines, and other medications. The same procedures that are used to make pharmaceuticals can also be utilised to make enzymes for laundry detergent, cheeses, and other items in the industrial sector. The commercialization of genetically modified crops has benefited farmers in a variety of countries, but it has also sparked much of the debate surrounding the technology. This has existed since the beginning of its use; anti-GM demonstrators destroyed the initial field testing. GM food safety is a major issue among sceptics, despite scientific consensus that currently available food derived from GM crops presents no more danger to human health than conventional food. Gene flow, non-target organism influence, food supply regulation, and intellectual property rights have all been mentioned as possible difficulties.

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