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Short Communication

Genetic Engineering Techniques Used for Gene Modification

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DESCRIPTION

Over the past two decades, genetic engineering of the mammalian central nervous system has advanced quickly. The ability to express a protein in mammalian cell culture has provided us with a wealth of knowledge about both healthy and unhealthy cellular processes. Gene transfer has long been a well-studied approach in molecular and cellular biology. This strategy has been expanded through the use of transgenic animals, but doing so takes time and presents interpretive challenges [1]. Neurobiologists have developed techniques to transfer genes of interest (transgenes) to certain populations of neuronal cells in order to enable more precise genetic manipulations.

Increased food production, reliability, and yields, improved flavour and nutritional content, and a reduction in losses from various biotic and abiotic stressors, like bacterial and fungal infections, are all positive effects of these genetic alterations. These goals continue to drive contemporary breeders and food scientists, who have developed more advanced genetic modification techniques for locating, evaluating, and choosing particular organisms with genetically enhanced traits. The prevention and treatment of human diseases is a major area of focus for genome editing. Genome editing is currently employed in research facilities to study diseases in cells and animal models [2]. For a wide range of illnesses, including single-gene diseases like cystic fibrosis, hemophilia, and sickle cell disease, it is being investigated in research and clinical trials. Additionally, it shows promise in the management and avoidance of more complicated illnesses like cancer, heart disease, mental illness, and HIV infection. Animal cells are frequently used in genetic manipulation that includes transferring genetic material into cultivated cells, although occasionally the recipient cells are single cells, cells found within a living model organism, or human or animal cells the fundamental ideas and procedures for introducing genetic material into whole mammalian cells in this chapter [3]. Transgenesis is the process of inserting genetic material into mammalian cells artificially. Non-viral transfer techniques generally have two benefits over viral techniques for transferring genetic material to mammalian cells. The most popular technique for evaluating the activity of genes in cultured mammalian cells makes use of RNA interference, a biological pathway where the creation of double-stranded RNA results in the inactivation of a particular gene.

Biological vectors in plants

The naturally occurring soil microbe *Agrobacterium* tumefaciens is well recognised for inflicting the crown gall disease on susceptible plant species. It is a unique disease because it introduces a small amount of its own DNA into the plant cell when it infects a host. The plant reads and expresses the transplanted genes as if they were its own after the transferred DNA is successfully integrated into the plant's DNA [4]. The genes that were transplanted control the synthesis of a number of compounds that have a role in the formation of a crown gall. One or more unique non-protein amino acids known as opines are among these compounds. Because opianes are translocated throughout the plant, food made from plants with crown gall will contain them. *Agrobacterium* strains without the disease-causing genes but with the ability to cling to and spread DNA to susceptible plant cells were created in the early 1980s [5]. Researchers created new strains of *Agrobacterium* that deliver and stably integrate particular new genetic material into the cells of target plant species by swapping out the DNA of interest for the DNA that causes the crown gall disease. All cells in the progeny carry the inserted genes and may express them if the transformed cell is regenerated into a whole fertile plant. The majority of GE plants currently being produced in commercial settings are caused by the naturally occurring genetic engineering agent *Agrobacterium*.

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