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Advancements in Genetic Engineering

Opinion Article

An Overview on Mechanism Involved in Somatic Gene Therapy

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DESCRIPTION

Somatic cell gene therapy entails inserting a human gene into a living person's somatic cells, which does not produce the eggs and sperms needed to produce the next generation. It cures a disease in the patient alone, rather than in the patient's descendants. A functioning gene is usually included in the new DNA to correct the effects of a disease-causing mutation. There are two types of gene therapy, depending on which cells are treated and where. Somatic gene therapy is primarily concerned with the transfer of a section of DNA to any cell in the body that does not produce sperm or eggs. Somatic gene therapy aims to treat genetic diseases by manipulating non-reproductive or somatic tissues. This gene therapy procedure includes removing some of the defective cells and injecting them with a cloned wild-type gene. Transgenic cells, which are transplanted into the patient's body, then provide the corrected gene function. Somatic gene therapy holds the promise of successful treatment and cure for previously fatal diseases. It has only been tested in a small number of genetic illnesses, and even then, treatment is complicated, demanding, and unclear.

A somatic cell is any cell in the body other than sperm and egg cells. Because somatic cells are diploid, they have two sets of chromosomes, one for each parent. Somatic cell mutations can affect individuals, but they are not passed down to children. Somatic cells are body cells that are not part of the germ line, which are the sexual organ cells that produce sperm and eggs. It is necessary for all living things to exist, but it contributes nothing to genetic transmission or inheritance to the next generation. As a result, it serves only the living creature and has no bearing on what happens to the organism's next generation.

Somatic gene therapy is a procedure that involves inserting a normal gene into the correct cells of a person with a hereditary condition, thereby permanently correcting the problem. The most basic methods of transferring genes into a person's cells are viruses and liposomes. In the nucleus of certain cells, the gene or genes are introduced onto a chromosome. The target cells could be bone marrow cells, which are easily separated and re-implanted. Because bone marrow cells proliferate throughout a person's life in order to produce blood cells, this method is only effective if the gene to be transferred has a biological function in the blood. A gene with a biological function in the lungs, muscle, or liver, would need to be delivered inside those organs. Accessing the relevant tissue, or ensuring that a gene is delivered where it is needed if it is required in multiple tissues, is a significant challenge in many cases.

This therapy involves implanting a human gene into the somatic cells of a living person, which do not produce the eggs and sperm that form the next generation. Somatic cell gene therapy aims to heal a condition in the patient alone, not in their offspring. Some risks are also associated with somatic gene therapy. It is possible that once viruses are introduced into the body, they will regain their ability to cause illness. If the new genes are introduced in the wrong place in DNA, they may cause tumors.

Currently, this therapy is focusing on disorders that affect only one tissue, such as cystic fibrosis and adenosine deaminase. It was initially proposed as a method of implanting a fully functional copy of a gene into a person who had a hereditary condition as a result of receiving only partially functional copies. Since then, several types of somatic cell gene therapy have been studied for the treatment of diseases such as AIDS and cancer that are not primarily caused by inherited genes. The genetic characteristics of somatic cell gene therapy have been mostly uncontroversial. Gene therapy is essentially just another medication delivery mechanism, a novel method of delivering a normal human protein to the correct location in the body.

CONCLUSION

Somatic gene therapy is still in its early stages, or it is more of an experimental treatment at the moment. Somatic gene therapy, on the other hand, focuses on improving genetic illness by manipulating nonproductive or somatic tissues either *ex vivo* or *in vivo*. This gene therapy procedure includes removing some of the defective cells and injecting them with a cloned wild-type gene. Somatic therapy has numerous proven benefits for people suffering from mental health conditions like Post-Traumatic Stress Disorder (PTSD), anxiety, and depression, as well as diseases like cystic fibrosis, adenosine deaminase deficiency, familial hypercholesterolemia, cancer, and Severe Combined Immunodeficiency (SCID) syndrome.

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