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Medicinal Values In Gene Therapy Using Gene Bombardment

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ABSTRACT:-Gene therapy Has emerged as a promising approach for treating genetic disorder and disease. Gene bombardment also known as biolistic is a technique used to deliver genetic material into cell using high velocity particles. this abstract highlighting the medicinal value of gene therapy using gene bombardment.

Key words:- Gene therapy, gene bombardment gene editing gene silencing,luxturna,Zolgensma, Kymriah, Immunotherapy

Key benefits:-Effective gene delivery:-Gene Bombardment enable effective delivery of genetic material into cells making it a valuable tool for gene therapy.

Treatment of genetic disorder :-gene therapy using gene bombardment has the potential to treat genetic disorder by introducing healthy copies of a gene into cell.

Cancer treatment gene bombardment can be used to deliver gene that kill cancer cell or inhabitant tumour growth.

Gene bombardment allow for target delivery of genetic material to specific cells or tissu.

Flexibility Jean bombardment can be used to deliver a wide range of genetic material including DNA RNA and oligonucleotides.

Introduction:-

Gene therapy:-Gene therapy uses gene treat a prevent disease by introducing removing or changing genetic material within a patient cells here are some medicinal values of gene therapy

Gene therapy techniques:-

Gene Replacement:-Replacing a faculty gene with a healthy one.

Gene Editing:-Editing gene to correct mutation or defects.

Gene Silencing:-silencing gene that are causing harm or contributing to disease.

benefit of gene therapy treatment of genetic disorder gene therapy can't read genetic disorder by replacing or repairing faculty gene

cancer treatment gene therapy can be used to kill cancer cell prevent their growth. treatment of inheritance disease gene therapy can treat inheritance disease such as sickle cell anemia,cystic fibrosis and muscular dystrophy.

.Potential for long term cure gene therapy has the potential to provide long term or permanent cure for certain diseas

Example of gene therapies:-

Luxturna:-Gene therapy for inheritance blindness that introduced a healthy copy of the RPE 65 gene into retinal cells.

Zolgensma-Gene therapy for spinal muscular atrophy That includes a healthy copy of the SMN1 gene into cells.

Kymriah:-Ajin therapy for certain type of leukemia that use CAR-T cell to target cancer cells.

Gene Bombardment or biolistic method

Also called" gene gun method"Tiny metal particles using gold or tungsten are coated with DNA and short into target cells the DNA interests the nucleus and integrates into the host genome.

thought gene bombardment is mostly applied in plants it has some medicinal relevant in experimental gene therapy and vaccine development.

gene encoding antigen are delivered into human as well as animal tissues

the body produce the antigen itself stimulates immunity. For example experimental vaccine for HIV ,hepatitis B, influenza and cancer immunotherapy.

Treatment of genetic disorder:-

Gene bombardment can deliver functional gene into defective human cell.

Potential application cystic ,fibrous muscular dystrophy, hemophilia.

Tumour suppressor gene or suicidal gene can be introduced.

Direct bombardment into skin or muscle cells allow local expression of therapeutic protein.

Delivering gene into neurons for disease like Parkinson 's or Alzhemer's.

Medicinal Values or benefits like non viral method useful for skin muscle tissues, good for vaccine research, work with DNA RNA or even CRISPR programme.

Demerits of Gene Therapy:-

Law efficiency of gene transfer only a small percentage of cells actually take up and express the introduce gene cell or tissue damage the high velocity micro projectiles can physically damage or even kill target cells reducing over or viability random integration the introduce DNA integrate at random sites in the genome which can disrupt essential genes or regulatory sequence leading to unintended mutation. high cost and technical requirements required specialised equipments and consumable.

limited target range work best on large strong walled cell (like plant cell) but it less effective for delicate animal or human cells .

Uncontrolled gene copy number of an introduce multiply copies of gene which may cause gene silencing Instability or abnormal expression levels.

Ethical and safety concern in human gene therapy random insertion may lead to insertional muta genesis and increase the risk of cancer other genetic disorder.

Conclusion:-

Gene therapy using gene bombardment hold great medicinal values as a non viral and relatively safe techniques for delivering therapeutic genes .It has wide application in DNA vaccine development treatment of genetic disorder ,cancer therapy and localised gene delivery in skin and muscle tissue. Although still limited compared to viral method. it provides a promising alternative for future medicinal research .Offering hope for safe and more effective therapies.