Cancer Gene Therapy

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-- What is Gene Therapy?

-- What the aims of Gene Therapy?

1. To stop or slow growth of damaged cells.
2. Make it easier for immune system to destroy damaged cells.
3. To prevent other cells and tissue from disease.

-- What are the general approaches used in gene therapy?

1. Insert normal gene instead the damaged gene.
2. Substitution of damaged gene by creating new recombinants.
3. Repair the damage gene.
4. Regulate the function of the damaged gene.

-- What vectors are used in Gene Therapy?

- Plasmids
- Viruses
- Liposomes
- Mini genes
- Artificial chromosomes.
- Else

What methods are used to introduce Gene Therapy ?

- *ex vivo* or *in vitro*
- *in vivo*
- Stem Cells
- Special treatment of infected cells. Salt\Hormones

What are the problems faced the Gene Therapy?

-- Unsafe methods which used.

-- Short life of the therapy.

-- Immunological responses.

-- Viral vectors problems.

-- Multi genes diseases.

-- Consequences of the random insertion of vectors.

-- Not reaching enough target cells.

-- Inefficient treatment or stopping cloned gene.

-- else

Gene Therapy Technologies

1. Gene Transfer .

2. Stop Target gene from Expression -attacking mRNA or Protein.

1. Gene Transfer Technology

1. Gene augmentation.

2.Direct killing of disease cells.

3.Assisted killing of disease cells by immune system.

2.Stop Target gene from Expression or attacking its products(mRNA-Proteins) Technology

A. Attacking the damaged gene

a. Knock out mutation*in vivo* mutagenesi s

b. Artificial correction of mutations or targeted\mutation correction.

c. Inhibition of damaged gene from expression

- Oligodeoxynucleotide- ODN
- Triplex- Forming Oligonucleotides - TFO

B. Attacking the defected gene mRNA\Antisense Therapeutics

1.Antisense Oligodeoxynucleotides-RNA-DNA hybrid.

2.Ribozymes- RNA-RNA .

3.Theraputic RNA editing.

C. Attacking abnormal Protein\ Protein Inhibitor

1. Intra-bodies

2.Aptamers

3. Mutant Protein

Cancer Gene Therapy Strategies

1.Gene transfer into tumor-infiltrating lymphocytes –TILs.

2.Adoptive immunotherapy by genetic modification of tumor cells.

3.AI by genetic modification of fibroblasts.

4. In vivo therapy.


Thank you