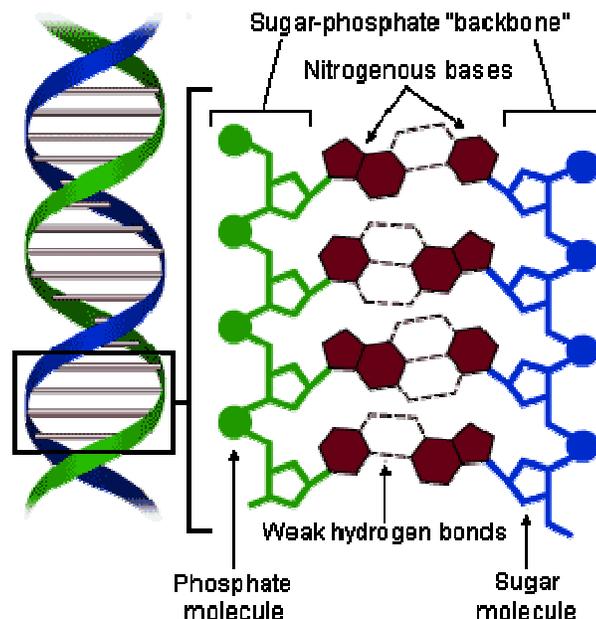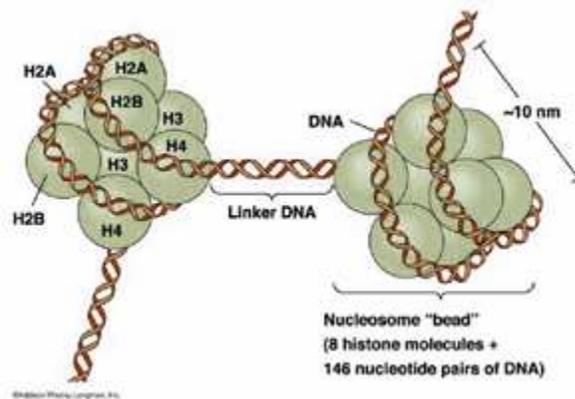# Computational Gene

Computational Gene refers to the Molecular Automation which allows insitu therapy cells that produce defective metabolites leading to the appearance of diseases. Gene therapy technique is used to replace the defective gene with a new gene so that it will express the normal character. The new gene will suppress the defective genes from its expression.

The Computational gene has two components. The structural part of the computational gene has DNA and Histone proteins like the naturally occurring genes. The constants of the computational gene are the conserved portions like Polymerase binding site, stop codons and start codons. The design parameters include introns, exons and position of both start and stop codons. By using the logical and biochemical constraints, both the constant and design parameters can be linked together to get the active computational gene. Molecular markers such as Single stranded DNA (ss DNA) are used as input to turn on the functional gene. By receiving the input signal, a double stranded DNA (ds DNA) will be generated. This double stranded DNA can be introduced into the nucleus of cell to produce the functional protein through transcription and translation processes.

Computational genes can be used to correct various forms of genetic disorders. One possible field is the cancer therapy. In all the normal body cells of Humans, a Tumour suppressing gene called p53 is present which control the cell division and prevent unwanted multiplication of cells which is the cause of tumour growth. If a mutation occurs in p53 gene, cells loss the control of cell division and multiply in an uncontrolled fashion leading to malignancy. For example a mutation in the codon 249 of p53 gene causes Hepatic cancer. The effect of this mutation can be

reduced using CDB3 protein that selectively binds with p53 gene and stabilize its function. CDB protein can be produced by a computational gene introduced into the cell.

Some important challenges are in the introduction of computational gene through gene therapy. The Gene should have low immunogenicity to prevent the formation of antibodies and should not be destroyed by the Nucleases present in the cell. It should not produce any toxic effects in the cells. Researches are going on to generate fully functional computational genes without any drawbacks to use in gene therapy

dmohankumar.wordpress.com