

# Everyday Science

SUMAIRA ASLAM

# GENES

- ▶ The term “gene” was introduced by Johanssen in 1909. Prior to him Mendel had used the word factor for a specific, distinct, particular unit of inheritance that takes part in expression of trait.
- ▶ A gene is defined as a unit of inheritance composed of a segment of D.N.A or chromosome situated at a specific locus (Gene Locus), which carries a coded information associated with a specific function and can undergo crossing over as well as mutation.

- ▶ It is the sequence of DNA nucleotides that contain the information for the production of an ordered amino acid sequence for a single polypeptide chain.
- ▶ There are present along the length of the chromosomes. Each gene contains information in code that allows the cell to make (almost always) a specific protein this is called gene product.

- ▶ Each gene codes for one specific protein or 1 Gene = 1 Protein.  
Number of genes in the human genome is approximately between 25000 and 30000.  
Genes normally exist in pairs, because the gene on one chromosome is matched at the equivalent site (locus) on the other chromosome of the pair.

# Types of Genes

- ▶ **Constitutive genes:**

They are those genes, which are constantly expressing themselves in a cell because their products are required for the normal cellular activities.

- ▶ **Non constitutive genes (Luxury genes):**

The genes are not always expressing themselves in a cell. They are switched on or off according to the requirement of cellular activities.

► **Inducible Genes:**

The genes are switched on in response to the presence of a chemical substance or inducer, which is required for functioning of the product of gene activity.

► **Repressive Genes:**

They are those genes which continue to express themselves till a chemical inhibits or repress their activity.

► **Multi genes:**

It is a group of similar or nearly similar genes for meeting requirements of time and tissue specific products.

► **Repeated Genes:**

The genes are present in multiple copies.

# Functions of genes

- ▶ Genes are components of genetic material and are thus unit of inheritance.
- ▶ Replication of genes is essential for cell division.
- ▶ Genes carry the hereditary information from one generation next.
- ▶ They control the structure and metabolism of the body .



# DNA (Deoxyribo Nucleic Acid)

- ▶ Genes are composed mainly of very long strands of DNA. The total length of DNA in each cell is about a meter. DNA is a double-stranded molecule, made up of two chains of nucleotides. Nucleotides consist of three subunits like
  - a sugar
  - a phosphate group
  - a base (bases are linked to the sugars)

- ▶ DNA carries a huge amount of information that determines all biological activities of an organism, and which is transmitted from one generation to the next.