# Glossary Molecular Genetics

**Adenine** A nitrogenous base, one member of the base pair A-T, adenine- thymine.

**Amplification** An increase in the number of copies of a specific DNA fragment; can take place in vivo or in vitro. See cloning, polymerase chain reaction.

**Base pair** Two nitrogenous bases, adenine and thymine or guanine and cytosine, held together by weak bonds. Two strands of DNA are held together in the shape of a double helix by the bonds between base pairs.

**Chromatid** A duplicated chromosome is formed by two longitudinal units or chromatids joined at the centromeric region. A chromosome is formed by two sister chromatids . Each chromatid is made of a long DNA strand unique and identical to the sister chromatid but different from the homologue chromosome originating from the other parent.

**Deletion** Loss of part of a whole chromosome or loss of DNA nucleotide bases.

**Domain** Discrete portion of a protein with its own function. The combination of domains in a single protein determines its overall function.

**E. coli** Escherichia colli is a common bacterium that has been studied intensively by geneticists because of its small genome size, normal lack of pathogenicity, and ease of growth in the laboratory.

**3' End, terminus** The end of a polynucleotide chain terminating with a 3' carbon atom. The 5' position of one pentose ring is connected to the 3' position of the next pentose ring via a phosphate group. All RNA chains, as well as DNA chains, grow in the 5' to 3' direction.

**5' End, terminus** The beginning of a polynucleotide chain terminating which has a free 5' group. The 5' position of one pentose ring is connected to the 3' position of the next pentose ring via a phosphate group. All RNA chains, as well as DNA chains, grow in the 5' to 3' direction

**Eukaryote** Cell or organism with membrane-bound, structurally discrete nucleus and other well- developed subcellular compartments. Eukaryotes include all organisms except viruses, bacteria, and blue- green algae

**Exons** The protein-coding DNA sequences of a gene.
Gene expression (French : expression génique) The process by which a gene coded information is converted into the structures present and operating in the cell. Expressed genes include those that are transcribed into mRNA and then translated into protein and those that are transcribed into RNA but not translated into protein.

**Genome** All the genetic material in the chromosomes of a particular organism; its size is generally given as its total number of base pairs.

**Genome sequencing** Determination of the order in which the bases are arranged within a length of DNA or RNA or, the sequence of amino acids that make up a protein.

**Genotype, haplome** The sum of genetic information or gene contained in the chromosomes of the individual as distinguished from their phenotype. It determines not a unique phenotype but a range of phenotype capacities referred to as an individual's 'norm of reaction' to the environment.

**Haploid** A single set of chromosomes: half the full set of genetic material present in the egg and sperm cells of animals and in the egg and pollen cells of plants. Human beings have 23 chromosomes in their reproductive cells.

**Haplotype** Genetic material carried by only one of two chromosomes and corresponding to a specific character

**Homologous chromosomes** A pair of chromosomes containing the same linear gene sequences, each derived from one parent.

**Insertion** The acquisition of extra nucleotides within a DNA sequence. They may affect only one nucleotide, a point mutation, but they usually affect several nucleotides in the sequence.

**Introns** The DNA base sequences interrupting the protein- coding sequences of a gene; these sequences are transcribed into RNA but are cut out of the message before it is translated into protein

**In vitro** Occurring outside a living organism.

**In vivo** Taking place in the living body.

**Molecular biology** Study of molecules carrying the hereditary message, DNA,RNA structure, synthesis, modifications or transformations.

**Molecular genetics** Branch of genetics concerned with the molecular structure and activities of the genetic material, including the replication of DNA, the transcription into RNA and the translation of RNA to form proteins.

**Nucleotide** A subunit of DNA or RNA consisting of a nitrogenous base (adenine, guanine, thymine, or cytosine in DNA; adenine, guanine, uracil, or cytosine in RNA), a phosphate molecule, and a sugar molecule (deoxyribose in DNA and ribose in RNA). Thousands of nucleotides are linked to form a DNA or RNA molecule.

**Prokaryote** Cell or organism lacking a membrane- bound, structurally discrete nucleus and other subcellular compartments. Bacteria are prokaryotes.

**Pseudogene** The sequence of pseudogene is similar to the structural gene but does not code for a protein.

**Purine** A nitrogen- containing, single-ring, basic compound that occurs in nucleic acids. The purines in DNA and RNA are adenine and guanine.

**Purine base** Adenine and Guanine.

**Pyrimidic base** Cytosine and Thymine.

**Pyrimidine** A nitrogen-containing, double- ring, basic compound that occurs in nucleic acids.The pyrimidines in DNA are cytosine and thymine; in RNA, cytosine and uracil.

**Replication fork** A Y shaped point at which two strands of a DNA molecule are unwound and separated during replication.

**Transition** A mutation in which either purine is substituted for the other, A for G or G for A or one pyrimidine is substituted for the other C for T or T for C.

**Translational readtrough** Translation of a mRNA at ahead of the normal termination codon.
**Transversion** A mutation in which either purine is substituted for either pyrimidine or vice versa.