Glossary of Terms:

Codon: A single unit of the genetic code that is made up of three (triplet) nucleotide bases in a DNA or RNA molecule specifying a single amino acid.

DNA (deoxyribonucleic acid): The molecule that encodes genetic information. DNA is a double-stranded molecule made of two twisting, paired strands held together by weak bonds between base pairs of nucleotides.

ELSI: The Ethical, Legal, and Social Implications involved in genomics.

Gene: The fundamental physical and functional unit of heredity. A gene is an ordered sequence of nucleotides located in a particular position within the genome that encodes a specific functional product (i.e., a protein or RNA molecule).

Genetic Code: The sequence of nucleotides, coded in triplets (codons) along the mRNA, that determines the sequence of amino acids in protein synthesis. A gene's DNA sequence can be used to predict the mRNA sequence, and the genetic code can in turn be used to predict the amino acid sequence.

Genome: All the genetic material of a particular organism; its size is generally given as its total number of base pairs or as its total number of genes.

Genomic Era: The new era in genetic research featuring rapid acquisition and integration of increasingly advanced genetic information resulting from the progress and completion of the Human Genome Project.

Human Genome Project: Research and technology development effort aimed at mapping and sequencing the entire genome of human beings.

mRNA: A molecule that can move from the nucleus to the cytoplasm of cells that serves as the crucial connecting message between information contained in the gene and protein synthesis. The structure of RNA is similar to that of DNA. The mRNA molecule serves as a template for the specific amino acid sequence of a protein.

Nucleotide bases: The basic subunits of DNA or RNA. Thousands of nucleotides are linked to form a DNA or RNA molecule. The four nucleotides in DNA contain the bases adenine (A), guanine (G), cytosine (C), and thymine (T). In nature, base pairs form only between A and T and between G and C; thus the base sequence of each single strand can be deduced from that of its partner.

Protein: A large molecule composed of one or more chains of amino acids in a specific order; the order is determined by the base sequence of nucleotides in the gene that codes for the protein. Proteins are required for the structure, function and regulation of the body's cells, tissues and organs, and each protein has unique functions. Examples are hormones, enzymes, and antibodies.

Ribosome: A cytoplasmic organelle that serves as the molecular machine on which polypeptide synthesis from mRNA occurs.

Sequencing: Determination of the order of nucleotides (base sequences) in a DNA or RNA molecule.

Transcription: The synthesis of an mRNA copy from a sequence of DNA (a gene), the first step in gene expression.

Translation: The process in which the genetic code carried by mRNA directs the synthesis of proteins from amino acids.

tRNA: A class of RNA that recognizes the triplet nucleotide coding sequences of mRNA and carries the appropriate amino acid to the ribosomes, where proteins are assembled according to the genetic code carried by mRNA.

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