

## **Molecular Genetics**

- **RNA:** RNA, or ribonucleic acid, is a molecule essential for various cellular processes, such as protein synthesis, gene regulation, and cell signaling.
- **Gene:** A gene is a specific sequence of DNA that contains the instructions for producing a functional product, such as a protein.
- **Mutation:** A mutation is a permanent change in the DNA sequence that can result in altered gene function or protein production.
- **Chromosome:** A chromosome is a thread-like structure composed of DNA and proteins found in the nucleus of a cell. It carries genetic information.
- **Genetic Code:** Genetic code refers to the specific sequence of nucleotides in DNA that determines the sequence of amino acids in proteins.
- **Nucleotide:** A nucleotide is the basic building block of nucleic acids, consisting of a sugar, a phosphate group, and a nitrogenous base.
- **Protein:** Proteins are large biomolecules consisting of amino acids that perform various functions in the body, including structural and enzymatic roles.
- **DNA:** DNA, or deoxyribonucleic acid, is a molecule that carries the genetic instructions for the development, functioning, growth, and reproduction of all living organisms.

## **Population Genetics**

- **Gene Flow:** Gene flow is the transfer of genetic material between populations, leading to genetic mixing and influencing the overall genetic diversity.
- **Evolutionary Forces:** Evolutionary forces refer to the processes, such as natural selection, genetic drift, mutation, and gene flow, that drive changes in populations over time.
- **Hardy-Weinberg Equilibrium:** Hardy-Weinberg equilibrium is a principle stating that allele frequencies in a population will remain constant over generations in the absence of evolutionary forces.
- **Genetic Variation:** Genetic variation refers to the diversity of alleles and genotypes within a population, contributing to evolution and adaptation.
- **Allele Frequency:** Allele frequency refers to the proportion of a specific allele in a population, calculated as the number of that allele divided by the total number of alleles.
- **Genetic Drift:** Genetic drift is the random fluctuation in allele frequencies within a population, leading to changes in genetic diversity over time.
- **Population Genetics:** Population genetics is the study of genetic variation and evolutionary processes within populations, focusing on how genes are distributed and change over time.

## Medical Genetics

- **Pedigree:** Pedigree in medical genetics refers to a diagram showing the genetic relationships among individuals in a family over generations.
- **Gene Therapy:** Gene therapy is a medical procedure that involves modifying a person's genes to treat or prevent disease.
- **Chromosomes:** Chromosomes are thread-like structures made of DNA and proteins found in the nucleus of cells, carrying genetic information.
- **Genetic Testing:** Genetic testing is a medical test that looks for changes or variations in an individual's genes, chromosomes, or proteins.
- **Mutation:** A mutation in Medical Genetics refers to a change in the DNA sequence that can lead to genetic disorders.
- **Phenotype:** The physical characteristics or traits of an organism that result from the interaction between its genetic makeup and the environment.
- **Genotype:** Genotype refers to the genetic makeup of an individual, including the specific combination of alleles present in their DNA.
- **Inheritance:** Inheritance in medical genetics refers to the passing of genetic traits or conditions from parents to offspring through DNA.

## Evolutionary Genetics

- **Evolution:** Evolution in evolutionary genetics refers to the change in allele frequencies in a population over generations due to natural selection.
- **Genetics:** Genetics in Evolutionary Genetics refers to the study of how genetic variation and inheritance mechanisms contribute to evolutionary processes.
- **Natural Selection:** Natural selection is the process by which organisms better adapted to their environment tend to survive and reproduce more successfully.
- **Mutation:** Mutation refers to a change in the DNA sequence of an organism, which can result in new genetic variations in populations.
- **Adaptation:** Adaptation in evolutionary genetics refers to the process by which a population evolves traits that enhance survival and reproduction.
- **Population Genetics:** Population genetics is the study of genetic variation within populations and how evolutionary forces such as natural selection and genetic drift shape this variation.
- **Gene Flow:** Gene flow is the transfer of genetic material between populations, which can lead to increased genetic diversity and reduced genetic differentiation.

- **Phylogenetics:** Phylogenetics is the study of evolutionary relationships among organisms, typically using genetic data to construct evolutionary trees or phylogenies.

## **Behavioral Genetics**

- **Phenotype:** Phenotype refers to the observable characteristics or traits of an organism, influenced by both genetic and environmental factors.
- **Twin Studies:** Twin studies in Behavioral Genetics involve comparing the similarities and differences in traits between identical and fraternal twins.
- **Gene-environment Interactions:** Gene-environment interactions refer to the complex interplay between genetics and environmental factors in shaping an individual's behavior and traits.
- **Behavioral Traits:** Behavioral traits in the context of Behavioral Genetics refer to observable characteristics influenced by genetic factors and environmental interactions.
- **Polygenic:** Polygenic refers to traits influenced by multiple genes, each contributing a small effect, in the field of behavioral genetics.
- **Heritability:** Heritability refers to the extent to which individual differences in behavior can be attributed to genetic factors rather than environmental influences.
- **Genotype:** Genotype refers to an individual's genetic makeup, including specific genes and alleles that influence behavioral traits and tendencies.

## **Epigenetics**

- **Epigenetics:** Epigenetics is the study of changes in gene expression caused by environmental factors, rather than alterations to the genetic code.
- **DNA Methylation:** DNA methylation is an epigenetic process where methyl groups are added to DNA molecules, affecting gene expression without altering the DNA sequence.
- **Histone Modification:** Histone modification refers to chemical alterations made to histone proteins that can affect gene expression and chromatin structure.
- **Gene Expression:** Gene expression refers to the process by which information from a gene is used to create a functional product.
- **Epigenome:** The epigenome refers to the complete set of chemical compounds that modify the DNA and regulate gene expression.
- **Chromatin Remodeling:** Chromatin remodeling refers to the dynamic alteration of the structure of chromatin that allows or restricts access to DNA for transcription.
- **Epigenetic Inheritance:** Epigenetic inheritance is the transmission of changes in gene expression patterns across generations without alterations in the DNA sequence.

