Glossary- Physical anthropology

Allele: one of two or more alternative forms of a gene that arise by mutation and are found at the same place on a chromosome

Ancestry: the lineage through which an individual is descended

Aneuploidy: an abnormal deviation in the total chromosome number, typically due to the addition or loss of a chromosome. In humans, this means any chromosome number other than 46.

Autosome: any chromosome that is not a sex chromosome (X or Y). A gene on an autosome is called "autosomal".

Base: along with a sugar and phosphate group, one of the three components that makeup a nucleotide. Bases are the "informational" part of the nucleotide that are responsible for DNA's ability to contain hereditary information.

Bipedalism: the act of an organism moving using its two rear limbs; for humans, one of the important traits associated with the ancestor of modern humans

Carrier: an individual that has one copy of a disease-causing allele of a gene. Carriers do not express the disease because two copies of the "bad" allele are required. However, they may pass the disease-causing allele to offspring.

Chromosome: a strand of DNA tightly wrapped around proteins called histones. Chromosomes are the way DNA is organized in a cell.

Colonoscopy: a medical procedure done to look at the large bowel and part of the small bowel and typically used as a screening method for cancer detection

Common ancestor: the evolutionary hypothesis that all living organisms are descended from a common ancestor; for humans, this is significant with respect to common ancestry with chimpanzees and other primates.

Cross-breed: to produce an organism from two genetically dissimilar parents

DNA (deoxyribonucleic acid): the molecule of heredity, composed of nucleotides. It is the carrier of genetic information within a cell that is transmitted from generation to generation.

DNA testing: the characterization of an individual's genetic makeup using various methods

Dominant: an allele that is expressed in an organism's phenotype, masking the effect of the recessive allele when present

Down-regulation: decreasing the rate of gene expression

Enzyme: a large biological molecule, typically a protein, that catalyzes a chemical reaction

Epigenetics: the study of chemical markers that are added to DNA and affect its three dimensional structure related to how tightly it is packaged to form chromosomes. This mechanism impacts whether or not a gene will be expressed.

Eugenics: the desire to improve the overall genetic makeup of the human population through selective breeding and elimination of "undesirable" traits. Eugenics was a somewhat popular movement in the early 20th century with the idea that certain races had qualities that were both superior to others and genetically heritable.

Gene: the basic unit of heredity. Typically a gene is a segment of DNA, that occupies a particular location on a chromosome, and encodes for a protein.

Gene expression: conversion of the information encoded in a gene first into messenger RNA and second into a protein

Gene therapy: a technique used to correct defective genes that are responsible for disease development typically through the introduction of a copy of the normal gene; a set of strategies that manipulate the expression of particular genes or corrects abnormal genes

Genealogy: in terms of genetics, the study of the genetic lineages of humans and other species

Genetic counselor: a healthcare professional who has received graduate education and training in medical genetics and counseling

Genetic distance: the difference in frequencies of traits between populations; used to compare genetic similarities between populations of the same species or similarities between separate species. Genetic distance arises when breeding stops, so it can be used as a measure of evolutionary relatedness.

Genetic isolation: a population in which very little interbreeding with other populations occurs, usually due to geographical or ecological separation; often leads to speciation or differentiation within one species for certain traits

Genetic markers: a specific DNA sequence, that typically differs from normal, that may increase the likelihood of developing a particular disease and can therefore be used as an indicator of increased disease risk.

Genome: the complete set of genes in an organism. The total genetic content in one set of chromosomes

Genome sequencing: determination of the order in which the bases are arranged within all the DNA of an organism

Genotype: the genetic makeup of an individual, often times in reference to a particular gene

Heterozygous: having two different alleles for a given gene; both alleles at corresponding loci are dissimilar

Histone: any of a group of small proteins that DNA wraps around to become compacted within the nucleus of a cell

Hominid: a taxonomic group of primates that includes the early ancestors of modern humans

Homo sapiens: the early primate species that originated in Africa and gave rise to all modern humans

Homozygous: having identical alleles for a given gene; both alleles at corresponding loci are identical

Human migration: the movement of humans from one geographical region to another; over thousands of years, genetically distinct populations may develop.

Karyotype: an array of all the chromosomes found in a cell of an individual. Typically the chromosomes are stained to reveal size, banding pattern, or other distinguishing feature to enable the identification of any abnormalities.

Law of Independent Assortment: each member of an allele pair on homologous chromosomes separates independently of the members of other pairs on other chromosomes so that the resulting allele combinations are random

Law of Segregation: the members of allele pairs on homologous chromosomes separate during the formation of gametes and are distributed to different gametes so that every gamete receives only one allele of the pair

Locus (plural=loci): The physical location of a gene on a chromosome

Mastectomy: a surgery to remove all breast tissue from a breast as a way to treat or prevent breast cancer

Mendelian genetics: an approach to heredity that focuses on patterns of inheritance from generation to generation. For example, if two heterozygotes mate, they have a 25% chance of producing a homozygous dominant offspring, a 50% chance of producing a heterozygous offspring, and 25% chance of producing a homozygous recessive offspring,

Molecule: the fundamental unit of a substance composed of atoms bonded together in a particular structure

Mutation: accidental, random changes in a DNA sequence caused by environmental factors and replication errors

Nucleotide: a compound consisting of a sugar and base linked to a phosphate group. Nucleotides form the basic structural unit of nucleic acids such as DNA

Nucleus: a membrane bound structure within a cell that contains the genetic material (DNA)

Pangenesis: an incorrect theory of heredity; each cell produces hereditary particles that circulate in the blood and eventually collect and are incorporated into reproductive cells to be passed onto offspring

Phenotypic/phenotype: the observable or physical characteristics of an individual, as a result of genetic expression and environment

Polyps: an abnormal growth of tissue projecting from a membrane lining

Race: the system of classifying humans into particular populations based on common ancestry, cultural background, language, geographical location, etc.

Recessive: an allele that produces its characteristic phenotype only when the paired allele is the same; will be masked if a dominant allele is present

Relatedness: in genetics, the degree to which one person is related to another; or, the degree to which one species is related to another

Sex-linked genes: a gene located on a sex chromosome. In humans, the sex chromosomes are the X chromosome and Y chromosome.

Single-Nucleotide Polymorphism (SNP): genetic variation in a DNA sequence that occurs when a single nucleotide in a genome is altered; SNPs are usually considered to be point mutations that have been evolutionarily successful enough to recur in a significant proportion of the population of a species

X-linked: a gene or DNA segment located on the X chromosome

Vector: a bacteriophage, plasmid, or other agent that carries and transfers genetic material from one cell into another

Zygote: the cell formed when two gametes (sperm and egg) are fused via sexual reproduction; earliest stage in embryonic development