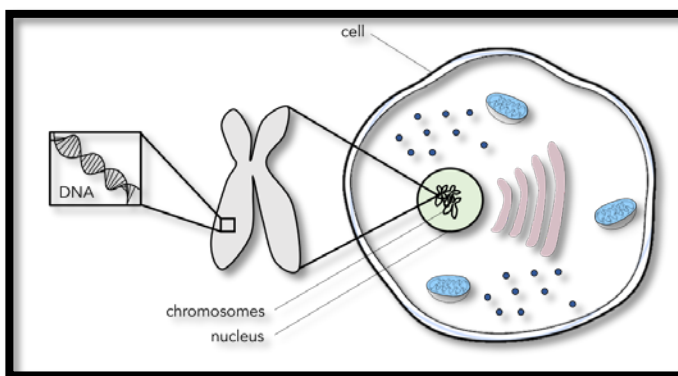




Basics of genetics

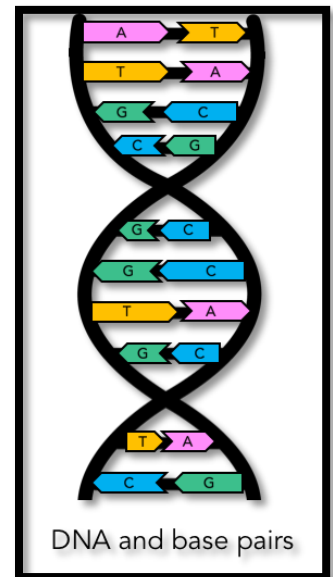
Cells: The central working units of every human being.



Chromosome: A structure found in the nucleus of cells that carries genetic information in the form of genes. Human cells normally contain 23 pairs of chromosomes, totaling 46. Of these 23 pairs, 22 pairs are known as **autosomes** that are similar for both females and males. The final 23rd pair is known as the **sex chromosomes** and differ between the sexes.

DNA: Deoxyribonucleic acid is a molecule containing instructions that guide cellular processes that allow an organism to develop, live, and reproduce. DNA is made up of two strands joined together through complimentary base pairs. The strands coil around each other to form a double helix.

Nucleotide bases: In the human, DNA is comprised of approximately three billion nucleotide bases: adenine (A), cytosine (C), guanine (G), and thymine (T). The DNA sequence (i.e., the order of the bases A, C, G, T) determines the instructions of life.



Genes: Sequences of bases within the three billion DNA bases. There are approximately 20,000 genes and they give the instructions on the production of proteins. These complex molecules elicit a variety of biological actions that are important to life. Genes are transferred from parent to offspring.

Allele: One of two or more alternate forms of a gene. Different alleles might result in different observable traits.

Genome: An organism's complete set of DNA. The entire human genome contains more than 3 billion DNA base pairs.

Genetic Mutation: The permanent modification of the sequence of the genome of an organism.

Genotype: The genetic make-up of an individual.

Phenotype: An individual's observable characteristics. It results from the combination of their genes (genotype) and environments, experiences, etc.

Polymorphism: The existence of two or more distinctly different genotype forms in a population of a specific species. In genetic terms, it illustrates variations that differentiate species individuals from each other. These are inter (between)-individual, often silent variances in the sequences of DNA that make members of a species unique. Polymorphisms are maintained by natural selection.

Epigenetics: Changes in the expression of genes (active versus inactive genes). These do not comprise alterations to underlying DNA sequence. Therefore, epigenetics involves changes in phenotype without changes in genotype. Epigenetic changes affect how our cells read our genes.

Epigenome: The set of chemical modifications to the DNA, which change the way cells use the DNA's instructions. The epigenome changes in response to environmental exposures or disease.

References

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