02 dna

Tuesday, January 11, 2022 1:43 PM

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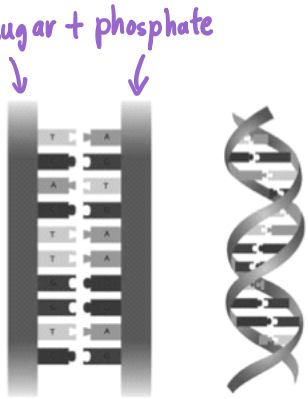
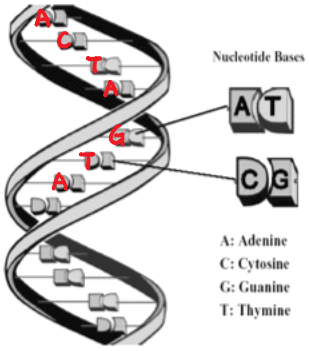
DNA

The Nucleus: Control Centre of The Cell

The instructions in the nucleus are carried in long, two-stranded molecules called Deoxyribonucleic acid, or DNA The DNA molecule looks like a twisted ladder. The two strands, or sides, of the DNA ladder wrap around each other in a spiral shape that scientists call a double helix. The sides of the DNA ladder are made of sugar and phosphate. The steps of the ladder are made of four nitrogenous bases, which are represented by the letters A (adenine), G (guanine), C (Cytosine), and T (thymine).

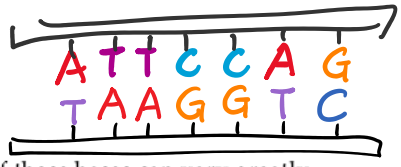


The Arrangement of Bases in DNA Directs All Cell Activities



Everything that occurs within a cell is the result of how the bases on the DNA molecule are arranged DNA molecules always join in a specific way:

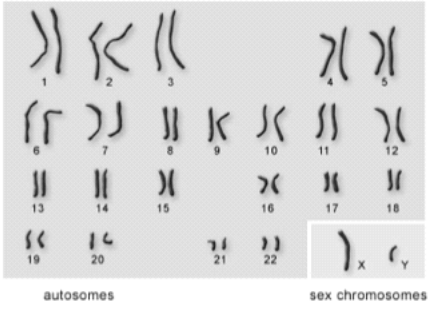
- A always joins with T
- G always joins with C



However, the number and type of these bases can vary greatly within the DNA molecule. In humans, a single DNA molecule can be several 3 billion base pairs in length.

DNA is Stored in Chromatin

Most of the time, DNA exists in the nucleus in the form of Chromatin. Chromatin is a substance that contains DNA and protein. Within each strand of chromatin is one molecule of DNA. When a cell is growing, (split) the DNA is replicated and aids in the manufacture of proteins the cell requires. When a eukaryotic cell is ready to divide, each strand of chromatin coils up into a very compact, coiled structure called a chromosomes



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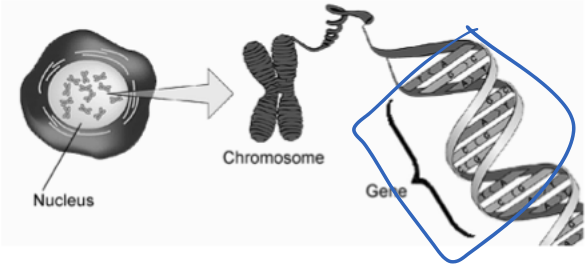
Every Organism has a Characteristic Number of Chromosomes

Chromosomes within the nucleus are found in pairs. Most human cells have 46 chromosomes arranged in 23 pairs, including one pair of chromosomes that help determine sex. In males, the 23rd pair of chromosomes is the XY pair and in females is the XX pair. Every living thing has a characteristic number of chromosomes.

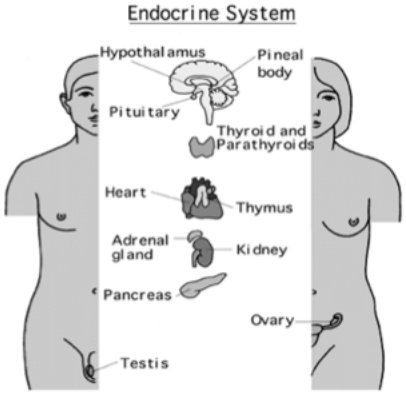
Genes are found on Chromosomes



Genes are small segments of DNA located at specific places on a chromosome. Genes store the information needed to produce up to 100,000 different proteins used in the cells of your body. Genes can vary in length from hundreds to thousands of base pairs. Every chromosome carries thousands of genes and therefore contains the information to make thousands of different proteins.

HW: WB P. 6-8

Proteins Determine What Body Cells Will Become and How They Function



Each of your body cells contains the _____ amount of genetic information stored within its 46 chromosomes, but only specific _____ are "read" in each cell to produce specific proteins. By making specific proteins, a cell becomes _____ to carry out a particular function. Therefore, proteins needed to make your muscles work are made only in your _____ cells. Thousands of different, specialized proteins called _____ speed up the hundreds of chemical reactions that occur within each cell. For example, digestive enzymes work in chemical reactions to break down _____ into nutrient molecules that provides _____ for the cell. Some proteins act as chemical messengers called _____. For example, growth hormone functions to prepare a cell for _____ by ensuring the cell has enough nutrients to divide.

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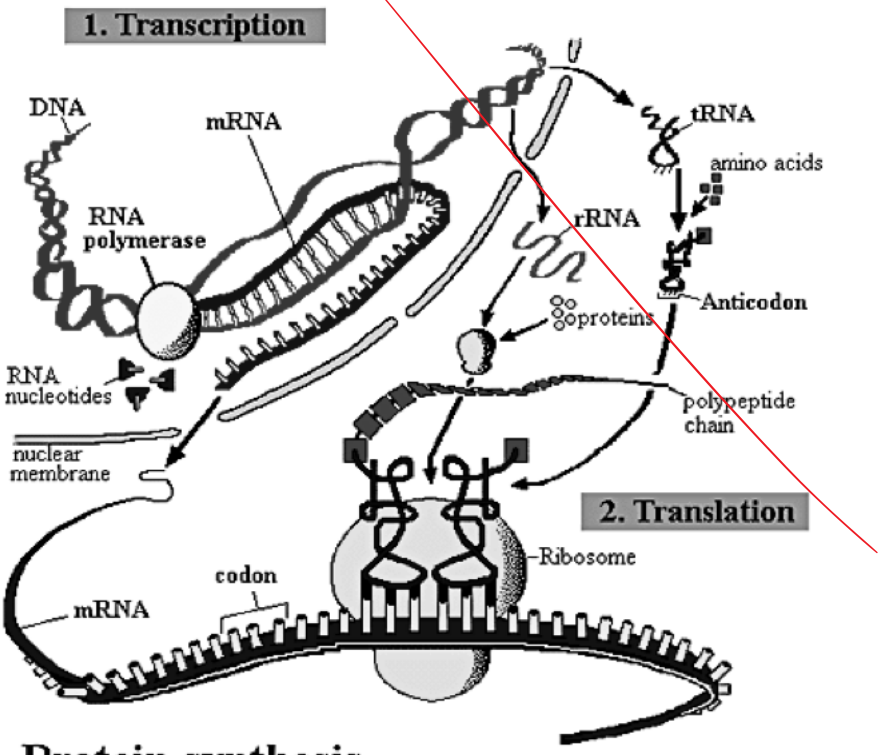
How Proteins are Produced

1. The Nucleus receives a chemical signal to make a specific _____.
2. The DNA message for a specific protein is _____ into a small molecule called _____ ___ or RNA.
3. RNA leaves through a nuclear _____.
4. The RNA message is delivered to the _____, and the ribosomes make the protein.

3. RNA leaves through a nuclear _____.
4. The RNA message is delivered to the _____, and the ribosomes make the protein.
5. The manufactured protein enters the _____ _____.
6. A _____ forms off the end of the endoplasmic reticulum and carries the protein to the Golgi body.
7. The Golgi body repackages the protein for _____ out of the cell.
8. A vesicle forms off the end of the Golgi body to carry the protein to the cell _____.
9. The vesicle attaches to the cell membrane, and its protein contents are _____ out of the cell.



Protein synthesis

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