




## Nucleic acids - RNA

### Messenger RNA

So, now, we know the **nucleus controls the cell's activities** through the chemical DNA, but how? It is the **sequence of bases** that determine which protein is to be made. The sequence is like a code that we can now interpret. The **sequence determines which proteins** are made and the proteins determine which activities will be performed. This is how the **nucleus** is the control center of the cell. The only problem is that the DNA is too big to go through the nuclear pores so a chemical is used to read the DNA in the nucleus. That chemical is **messenger RNA (mRNA)**. The messenger RNA (mRNA) is small enough to go through the nuclear pores. It takes the "message" of the DNA to the **ribosomes** and "tells them" what proteins are to be made. Recall that proteins are the body's building blocks. Imagine that the code taken to the ribosomes is telling the ribosome what is needed - like a recipe.

Messenger RNA is similar to DNA, except that it is a **single strand**, and it has **NO thymine**. Instead of thymine, mRNA contains the base **Uracil**. In addition to that difference, mRNA has the **sugar ribose** instead of deoxyribose. RNA stands for **Ribonucleic Acid**.

**Color** the mRNA as you did the DNA, except **Color** the ribose a DARKER BLUE, and the uracil brown. 

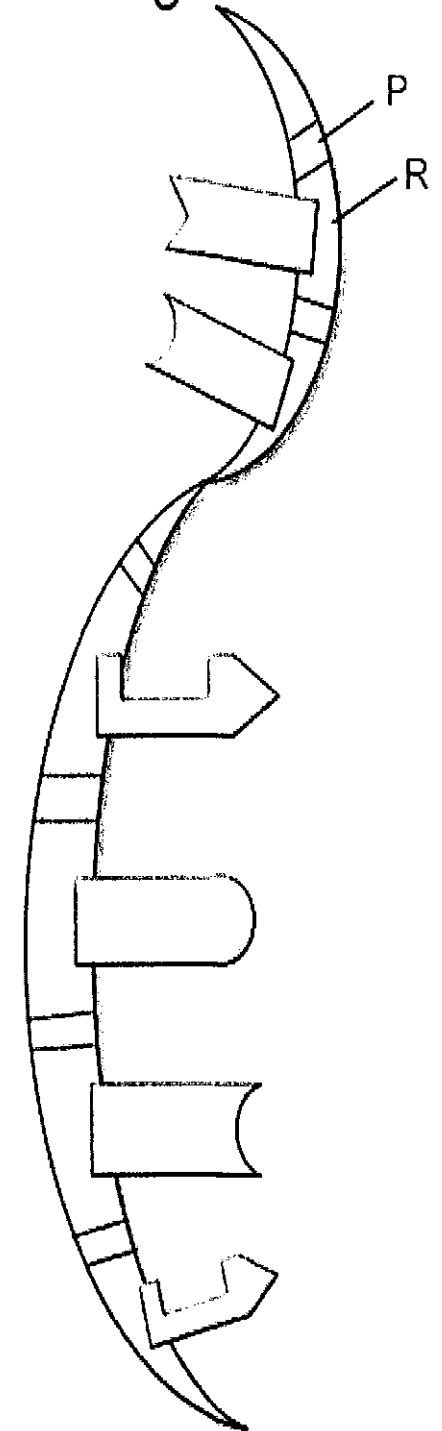
**Color** all the phosphates pink (one is labeled with a "p")

**Color** the adenines green. 

**Color** the guanines purple. 

**Color** the cytosines yellow. 

### Messenger RNA



mRNA has a \_\_\_\_\_ strand of nucleotides.

\_\_\_\_\_ replaces \_\_\_\_\_ on RNA.

\_\_\_\_\_ is the pentose sugar on RNA.

\_\_\_\_\_, not DNA can leave the nucleus through \_\_\_\_\_ in the nuclear envelope.

Proteins are made at the \_\_\_\_\_.

## The Blueprint of Life

**Every cell** in your body has the same "blueprint" or the **same DNA**. Like the blueprints of a house tell the builders how to construct a house, the cellular DNA "blueprint" tells the cell how to build the organism. Yet, how can a heart be so different from a brain if all the cells contain the same instructions? Although much work remains in genetics, it has become apparent that a **cell has the ability to turn off most genes and only work with the genes necessary to do a job**. We also know that a lot of DNA apparently is **nonsense and codes for nothing**. These regions of DNA that do not code for proteins are called "introns," or sometimes "junk DNA." The sections of DNA that **do actually code for proteins** are called "**exons**."

\_\_\_\_\_ are non-coding segments of DNA.

### *Questions:*

9. What sugar is found in *RNA*?

13. Why is RNA necessary to act as a messenger? Why can't the code be taken directly from the DNA?

14. Proteins are made where in the cell?

15. How do some cells become brain cells and others become skin cells, when the DNA in ALL the cells is exactly the same?

16. Why is the DNA molecule referred to as the "blueprint of life"?