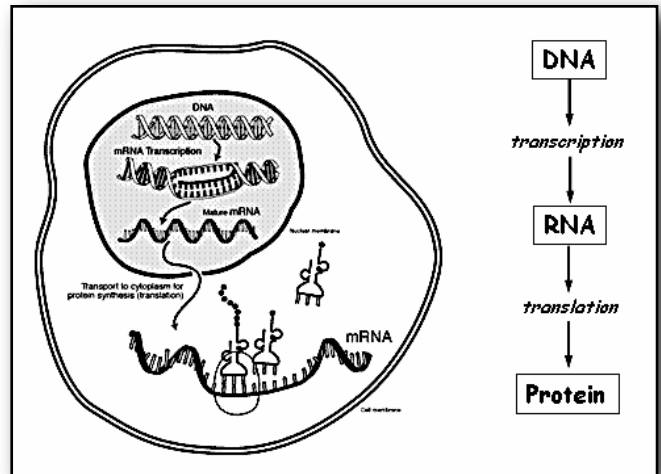


# Eukaryotic Genome Regulation

One of the key differences between human cells is that different genes are active in different cell types. Human genes cannot all be active at the same time. If they were, all the cells in our bodies would look the same and have the same functions. Specialization of cell types in all eukaryotic organisms is accomplished by controlling which genes are active and which are inactive.



1. In eukaryotes, gene expression or gene product expression can be controlled at several different levels. Indicate what types of control occur at each level of gene or gene product expression.

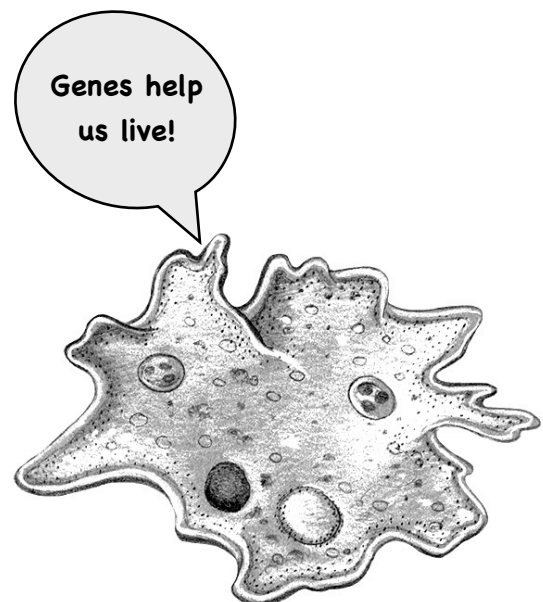
Level of Control	Types of Control
a. The gene or DNA itself.	
b. The mRNA product of the gene.	
c. The protein product of the mRNA.	

2. Single-celled organisms like *Amoeba* and *Paramecia* often live in environments that change quickly and often. How do the following types of control allow organisms like *Amoeba* to respond most quickly to frequent short-term environmental changes? What types of situations would best be suited by each type of control? Explain your reasoning.

a. Control of mRNA transcription from DNA.

b. Control of enzyme concentration by controlling the rate of mRNA translation.

c. Control of the activity of existing enzymes.



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