

Translating the Code of DNA

DNA provides the instructions for the cell to conduct its activities but it cannot carry out the instructions without the help of other nucleic acid molecules... or RNA. RNA is required to "read" the genetic code contained in the DNA of a cell, and RNA is responsible for carrying out these instructions. There are different types of RNA for the different jobs to be done...

- ❖ What does messenger RNA (mRNA) do?
- ❖ What is ribosomal RNA (rRNA)?
- ❖ What does transfer RNA (tRNA) do?

TRANSCRIPTION is the process wherein mRNA is created as a complementary copy of the bases in the DNA strand... A, G, C and T. Complementary means that when the DNA strand has a cytosine base, the mRNA base pair would have to be guanine. But remember, RNA replaces thymine with uracil.

TRANSLATION is the process wherein the cell uses the instructions (now contained in mRNA) to make the proteins needed for cellular activities. In order for this to happen, mRNA is run through a ribosome. As the bases along the mRNA move through the ribosome, the code is read and the proper amino acid is brought to the ribosome by tRNA where they are assembled. The assembling of amino acids into long chains form a protein and the tRNA molecules break off. The properties of each protein are determined by the order of the amino acids.

- ❖ What is a codon?
- ❖ What is an anticodon?
- ❖ How long will this process continue?
- ❖ *Look at the codon table in Chapter 10 of your book...*

Which amino acids do the following code combinations represent?

UGG -	GCA -
AUG -	CAU -
GCC -	GCU -
UCC -	AGU -

What else does AUG code for?

What does UGA signify?

So... if the DNA strand reads...

TACTCTTGGAGACCCCTCCATGATTGGCGTTATATT

What will the mRNA have to be? _____

And what would the codons be? _____

So... what will the chain of amino acids be? *Use the codon table in Chapter 10 of your book...*

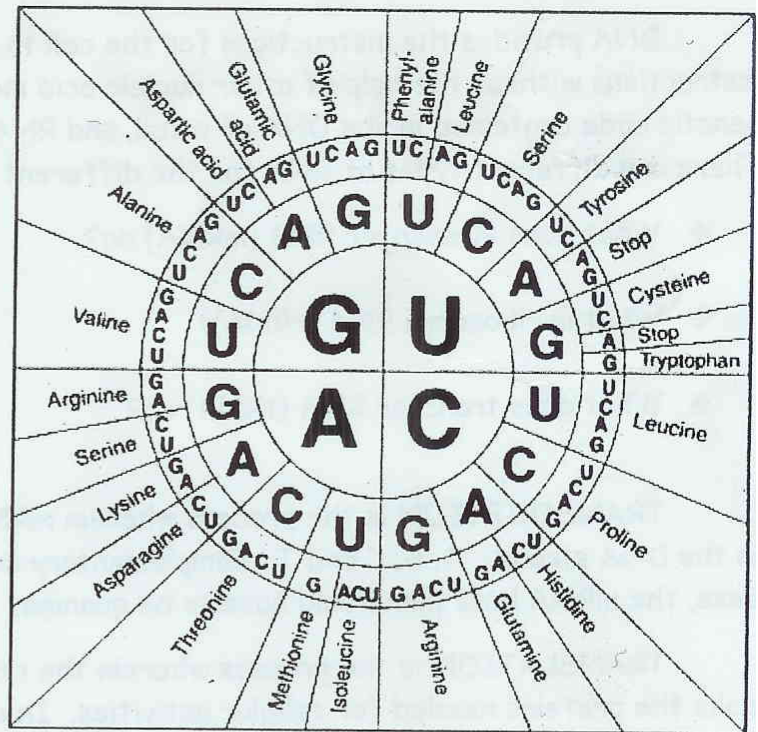
FROM DNA TO PROTEIN...

DNA (gene template)
TACCCTCAA...

mRNA (codons)
AUG GGA GUU...

tRNA (anticodons)
UAC CCU CAA...

PROTEIN (amino acids)
Methionine (start) – glycine – valine ...



ATATATAT

