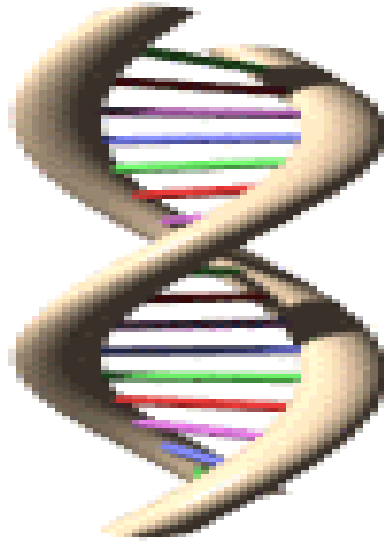


PROTEIN SYNTHESIS

CHP-9&10



DNA:

- TELLS THE CELLS WHICH PROTEINS TO MAKE AND WHEN

REVIEW OF DNA STRUCTURE:

- SUGAR-DEOXYRIBOSE
- PHOSPHATE GROUP
- NITROGEN-CONTAINING BASES

DOUBLE HELIX STRUCTURE:

- SUGAR AND PHOSPHATE GROUP
MAKE UP THE BACKBONES
- NITROGEN BASES FORM THE
LADDER STEPS

FOUR NITROGEN CONTAINING BASES:

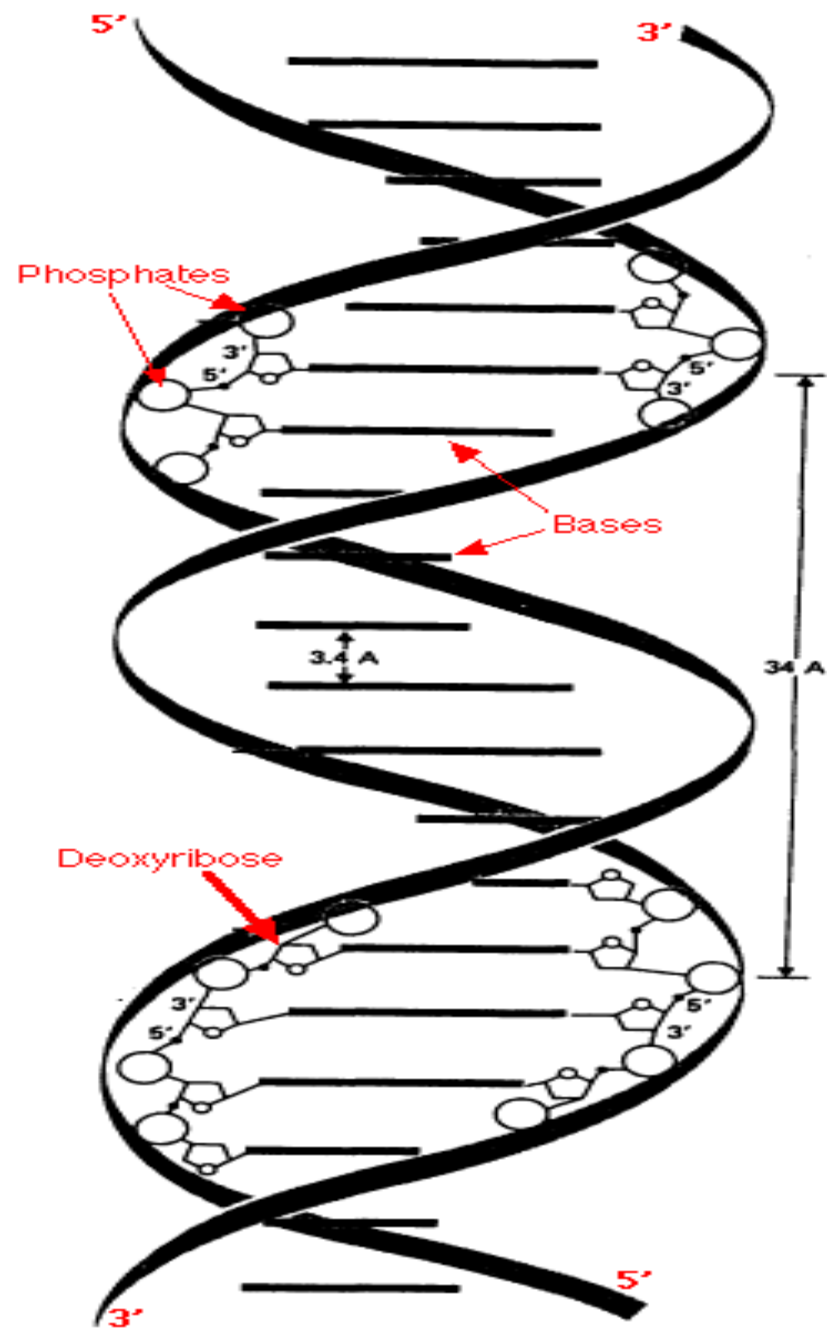
- ADENINE-A
- GUANINE-G
- CYTOSINE-C
- THYMINE-T

NITROGEN BASES ARE PUT INTO TWO GROUPS:

- PURINES-2 RINGS OF CARBON
ADENINE & GUANINE
- PYRIMIDINES- 1 RING OF CARBON
CYTOSINE AND THYMINE

COMPLEMENTARY BASE PAIRING:

- ADENINE ALWAYS PAIRS WITH THYMINE (A=T) Two bonds
- CYTOSINE ALWAYS PAIRS WITH GUANINE ($C \equiv G$) Three BONDS



DNA RESPONSIBILITIES AND ORDERS:

1. REPLICATION
2. TRANSCRIPTION
3. TRANSLATION

REPLICATION:

- DNA MAKES EXACT COPY OF ITSELF
- TAKES PLACE IN THE CELLS NUCLEUS
- DOUBLE HELIX UNWINDS & IS READ AT THE REPLICATION FORK
- ENZYMES BRING BASE PAIRS TOGETHER
- A-T-T-C-C-G MAKES T-A-A-G-G-C
- THIS IS WHERE ERRORS MAY OCCUR AND CAUSE MUTATIONS

The Cell Nucleus

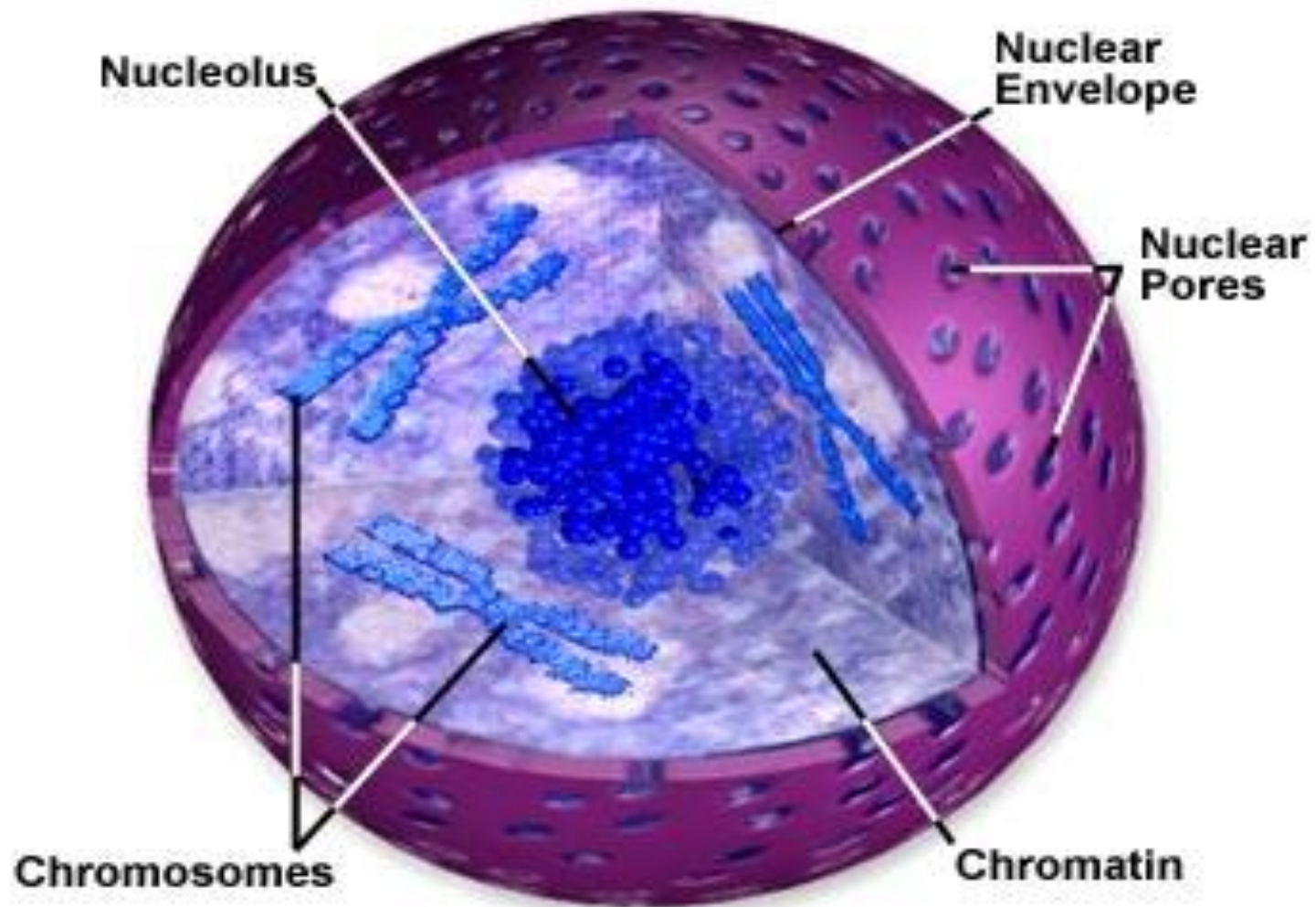


Figure 1

Protein synthesis-makes
proteins out of A.A. also
called a polypeptide.

RNA-RIBONUCLEIC ACID:

- CODES FOR PROTEIN SYNTHESIS
- IS A SINGLE STRAND COPY OF DNA
- URACIL REPLACES THYMINE IN RNA,
SO (A COMBINES WITH U)

THREE TYPES OF RNA:

1. MESSENGER RNA-mRNA-carries message from proteins to be built
2. TRANSFER RNA-tRNA-carries A.A. to building site
3. RIBOSOMAL RNA-rRNA-factory for protein synthesis

Ribosome Structure

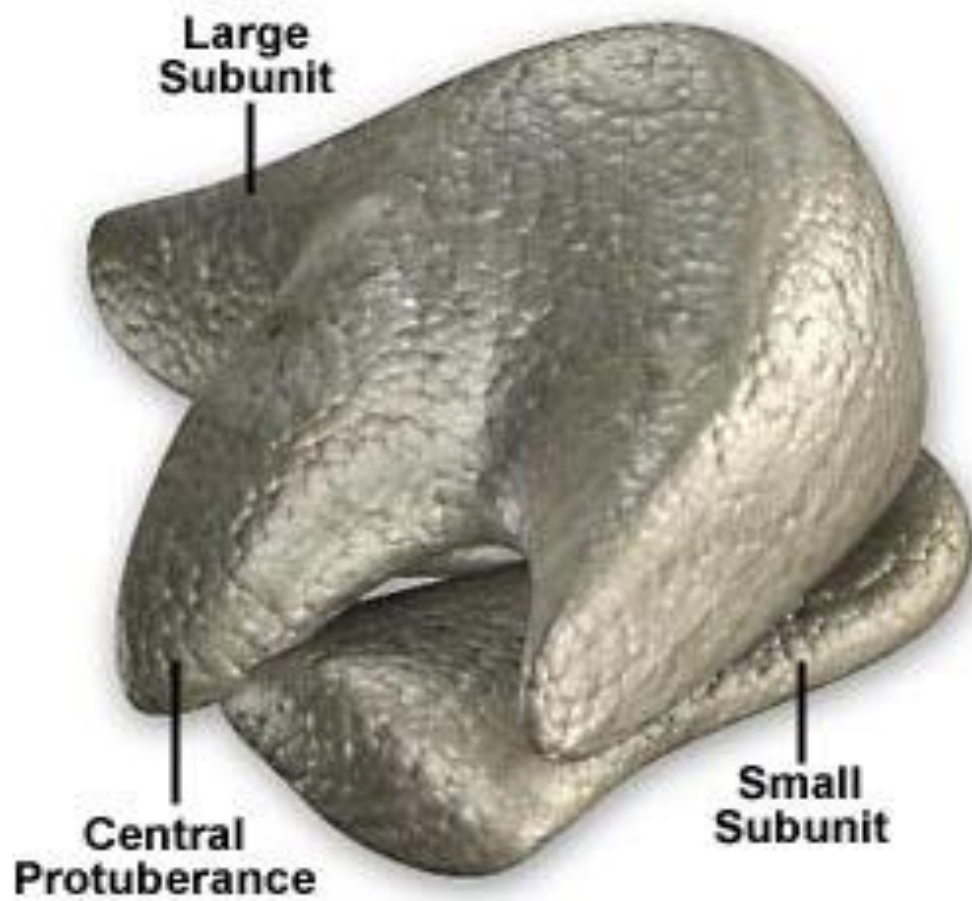


Figure 1

TRANSCRIPTION:

- DNA is copied to form mRNA

TRANSLATION:

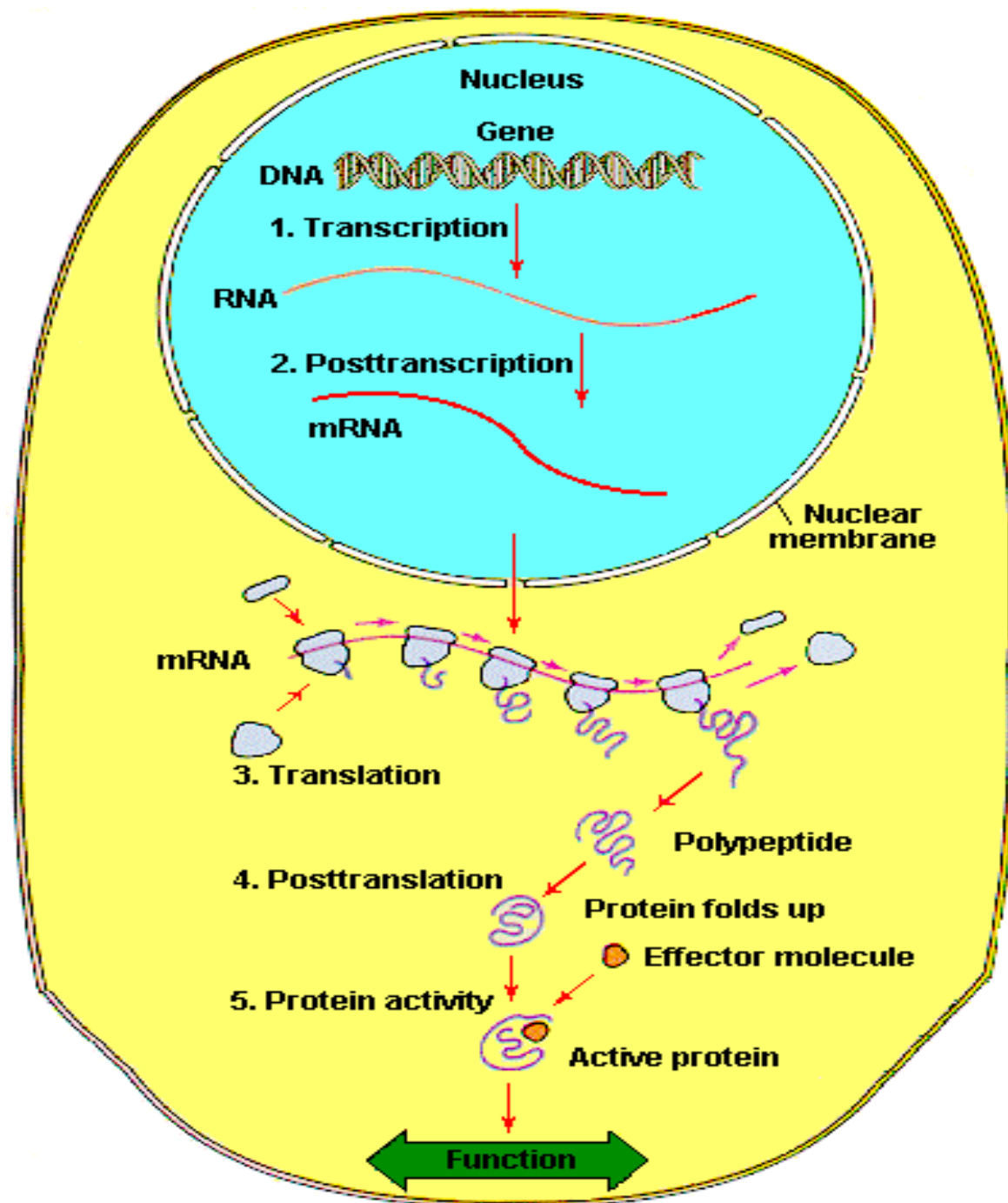
- Factory where PROTEINS are made

GENETIC CODING:

- THREE mRNA NUCLEOTIDES CALLED A CODON build THE A.A. CHAIN
- START CODON
- STOP CODON
- SEE CHART

		Second letter				Third letter
		U	C	A	G	
First letter	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } UCC } Ser UCA } UCG }	UAU } Tyr UAC } UAA Stop UAG Stop	UGU } Cys UGC } UGA Stop UGG Trp	
	C	CUU } CUC } Leu CUA } CUG }	CCU } CCC } Pro CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } CGC } Arg CGA } CGG }	
	A	AUU } AUC } Ile AUA } AUG Met	ACU } ACC } Thr ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	
	G	GUU } GUC } Val GUA } GUG }	GCU } GCC } Ala GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } GGC } Gly GGA } GGG }	

- * Complete example on board
- Show simulation at www.wisc-online.com
- search protein synthesis



Links

- Atoms-molecules-DNA-genes-chromosomes → amino acids- proteins → traits → organisms → species → Biosphere