RNA Notes

1. **RNA and Protein Synthesis**

A. RNA or RIBONUCLEIC ACID is found in the NUCLEUS.

B. RNA is needed for the COPYING OF DNA TO MAKE PROTEIN IN THE RIBOSOMES.

C. **Structure of RNA**

1. RNA is a SINGLE strand.

2. The building blocks RNA are also called NUCLEOTIDES which have 3 parts:

a. SUGAR

b. PHOSPHATE

c. BASE

URACIL replaces thymine in RNA.

3. Complementary bases are ADENINE, THYMINE, GUANINE, CYTOSINE

EX. DNA = A T C G A T T C G

mRNA = U A G C U A A G C codons for translation

tRNA= U A G C U A A G C anticodons

D. **RNA** DIFFERS **from DNA** as follows:

1. SINGLE STRAND 1. DOUBLE STRAND

2. RIBOSE SUGAR 2. DEOXYRIBOSE

SUGAR

3. URACIL 3. THYMINE

E. There are 3 TYPES of RNA used to help make proteins:

1. Messenger RNA (mRNA)- COPIES DNA CODE AND TAKES IT TO THE RIBOSOMES

2. Transfer RNA (tRNA)- PICKS UP AMINO ACIDS FROM CYTOPLASM AND BRINGS THEM TO THE RIBOSOME

3. Ribosomal RNA (rRNA) - READS THE CODE AND PUTS AMINO ACIDS IN ORDER TO MAKE PROTEINS

AMINO ACIDS are the ingredients (BUILDING BLOCKS) of proteins. Proteins are made in the RIBOSOMES.

IV. **Transcription** of RNA

A. Transcription is the copying of 1 SIDE of the DNA by the mRNA

After the CODE or the recipe is copied, it is taken to the RIBOSOME so it can be read and proteins can be made.

B.The **process of transcription** goes as follows:

1. ENZYMES (DNA POLYMERASE) help the DNA UNZIP

2. mRNA NUCLEOTIDES float in and MATCH UP with exposed bases on

ONE side of the DNA molecule.

3. Matching of NUCLEOTIDES continues until A RNA COPY is formed along the DNA.

4. The mRNA strand LEAVES the DNA and goes to the RIBOSOME and

the DNA strand RE-ATTACHES.

V. **Translation**

A. Translation - The mRNA code is READ by the rRNA in the ribosomes so proteins can be made.

B. To make the reading or translation of mRNA easier, it is read in TRIPLETS

called CODONS. The ANTICODON of the tRNA matches the CODON OF THE mRNA

C. The job of the tRNA is to pick up specific AMINO ACIDS (that are floating around in the CYTOPLASM) and TRANSPORTS them to the ribosomes. (Like putting a puzzle together.)

D. The **process of translation** goes as follows:

1. The mRNA takes the COPY to the RIBOSOME.

2. Each tRNA, which is made of 3 NUCLEOTIDES. (called the ANTICODON) picks up the proper AMINO ACID from the cytoplasm

and carries it to the RIBOSOME.

Codons and Anticodons are COMPLIMENTARY.

3. At the ribosomes, the rRNA READS the mRNA code and matches the mRNA CODON with the proper tRNA ANTICODON. By doing this, the AMINO ACIDS are placed in the PROPER ORDER and proteins are made using the RECIPE of the DNA.

Amino Acids come from the FOODS we eat each day. There are 20 common amino acids we need to be aware of.

Peptide Bonds- Hold amino acids together to form the proteins