Biochemistry Review Module 1

DNA-

- 1. Located in nucleus
- 2. Double helix
- 3. Nucleic acid
- 4. Adenine/Guanine/Cytosine/Thymine
- 5. A-T/C-G pairing
- 6. Duplicates itself and passes on to generation to generation
- 7. Contains 46 chromosomes (23 pairs from mother and father)
- 8. Stores and transmits-chemicals and traits

RNA-

- 1. Carries important info from DNA to the body (Transcription)
- 2. Used to make proteins (Translation)
- 3. Single stranded
- 4. 3 types of RNA (mRNA- messenger contains codons, rRNA-ribosomal contains 2 subunits and tRNA- transfer amino acid with end codon)

- Central Dogma- replication of DNA process= DNA- transcription BNA translation- Protein Steps of DNA replication-1. DNA must be separated 2. New DNA cont 2. New DNA sy a proteir
 - DNA polymerase takes the individual nucleotides and matches them up to the parental sequences to ensure a correct pair.
 - DNA polymerase does not start synthesis of a new strand, it must bind with a RNA primer
 - RNA primer is synthesized by RNA polymerase

Genes- encoded with information/ small segment of DNA

- 1. Gene Expression- the ability to turn genes on and off
- 2. Epigenetics- packaging of DNA: DNA wrapped around histones to make nucleosomes
 - Wide spread nucleosomes=genes ON (i.e. a dance floor-more space you can get your dance ON)
 - Tightly packed nucleosomes = genes OFF •
 - Environment can change genetics in generations •

Genetic sequence- 5'(phosphate)- 3' (sugar)

Non-Complementary	Template Strand: non-coding
	Coding Strand: non-template
	Coding Strand: mRNA (identical)
	Non-Template Stand: mRNA
Complementary	Template Strand: non-template strand
	mRNA: tRNA/non-coding strand:mRNA



Anaerobic Respiration- NO O2 and ETC present- makes 2 ATP

Fermentation- formation of lactate regenerates the NAD⁺ that was used during glycolysis, thus allowing glycolysis to continue making small amounts of ATP for the cell.



Cori Cycle- lactate produced by fermentation leaves the cell and enters the blood. The liver cells take up the lactate from the blood and use the gluconeogenesis pathway to convert two molecules of lactate back to glucose.



Diabetes- results from a decreased ability to produce insulin or a decreased sensitivity of cells to the insulin produced by the body (type I and type II, respectively).

- **Metformin** is a drug that can lower blood glucose by decreasing efficiency of transferring electrons in the electron transport chain, which decreases the overall production of ATP
- Treatment with **metformin** can increase the risk of elevated lactate levels in the blood, a condition known as **lactic acidosis**, because it lowers the blood pH.