Physiology 115 **Name _____**
Spring 2015

QUIZ #5

For the multiple choice questions, there is *one* and *only one* best answer. Use the back of the sheet if you need to complete answers.

1. Which one of these is true?
   a. a centriole has two centrosomes
   b. a centriole has one centrosome
   c. centrosomes are located within the nucleus
   d. centrosomes are microtubule-organizing centers for the cell
   e. centrosomes help ribosomes in protein synthesis

2. Which of these cell structures is a location where ribosomal RNA (rRNA) is synthesized and ribosome proteins assembled to form the large and small ribosomal subunits?
   a. plasma membrane
   b. nucleolus
   c. smooth endoplasmic reticulum
   d. mitochondria
   e. peroxisome

3. Which type of RNA bonds with the amino acid that will become part of the polypeptide during protein synthesis (translation)?
   a. ribosomal RNA (rRNA)
   b. messenger RNA (mRNA)
   c. transfer RNA (tRNA)
   d. chromosomal RNA (cRNA)
   e. none of the above

4. Do EITHER (a) OR (b)
   (a) The human genome is 30% adenine (A). What are the percentages for the other three bases C, G, and T
   (b) Give one fact—any fact---EACH of (i) microfilaments, (ii) microtubules, and (iii) intermediate filaments?

   (a) Since A = T, then **%T = 30%**. Now 100% – (%A + %T) = 100% – (30% + 30%) = 40%
   Since %G = %C and %G + %C = 40%, algebra quickly shows that **%G = %C = 20%**

   (b) Multiple possibilities
   i. microfilaments: made of actin polymer; involved in forming microvillus; make up terminal web; can interact with unconventional myosin in contractile functions; form the contractile ring of the cleavage furrow in cell division; have + and – ends
   ii. microtubules: hollow tubules formed from alpha- and beta-tubulin dimers; can affect cell shape; are stiff; can relocate organelles and vesicles by interacting with dynein

iii. intermediate filaments: made of keratins and other proteins, composed of lamins in nucleus that give it structure; composed of 8 protofilaments; have a protofilament formed from staggered tetramers;