Due date: _____

Biosurfing

You need to read this assignment online to follow the blue links. Your paper must be typed. Refer to the Style Sheet.

1. Use CELLS *alive!* to answer the questions below.
   a. Sketch a cell to show apoptosis.
   b. Why would you want to control apoptosis in cancer?
   c. Why would you want to control apoptosis in strokes?

2. Look at the movie of *Dictyosletium*.
   a. Is the cytoskeleton rigid like the vertebrate skeleton?
   b. What is *Dictyostelium*?
   c. How does it differ from the slime mold you used in Lab Experiment 1?

3. PubMed is an index to articles published in medical and scientific journals maintained by the National Library for Medicine. Check out PubMed by looking for an article on a disease associated with the cytoskeleton. Give the articles citation in the proper format.

4. Information science has been applied to biology in the field of *bioinformatics*. The National Center for Biotechnology Information (NCBI) creates public databases for storage and organization of the vast amount of informtion available on proteins and genes. Genomic maps are published in a database called BLAST (Basic Local Alignment Search Tool). Go to the Map View in BLAST, click on the 🔍 to the right of *Homo sapiens*
   a. What is the longest chromosome?
   b. Type eye color in the Search Box/ What chromosome(s) is eye color on?
   c. The p53 gene is a tumor suppressor gene, i.e., its activity stops the formation of tumors. If a person inherits only one functional copy of the p53 gene from their parents, they are predisposed to cancer and usually develop several independent tumors in a variety of tissues in early adulthood. However, mutations in p53 are found in most tumor types, and so contribute to the complex network of molecular events leading to tumor formation. Type p53 in the Search Box. (1) On what chromosome is p53 located? (2) In one sentence, summarize what the hits were on the other chromosomes.
   d. The protein encoded by p53 has 393 amino acids. Mutations would change one or more amino acids. A DNA array can be used to detect the specific mutation in a patient. What is the value of knowing the specific mutation in a patient's cancer cells?

5. Assume you have isolated a protein and sequenced the amino acids in that protein. The amino acids are abbreviated by single letters (Amino acid code). (FASTA is a way of writing proteins and nucleic acids in one letter codes that work in any language. FASTA stands for Fast All.) Use BLAST to see if this protein is known and what its function is. Go to NCBI home, select BLAST from the blue menu bar. Select Protein BLAST. Copy and paste the following into the FASTA Search box. Then click the blue BLAST button at the bottom of the page.

   ETLMEYLENPKKYIPGTKMIFAG

   When the results are tabulated,
   a. What is the protein?
   b. Provide a one-sentence description of the function of this protein.
   c. Click on Taxonomy Reports, what other types of organisms have this protein?

6. Return to Protein BLAST, Copy and paste the following into the Search box. Then click the BLAST! button at the bottom of the page.

   VHLTPEEKSAVTALWGKVNVDEVGGEALGRLLV
   VYPWTQRFFESFGDLSTPDAVMGNPKVKAHGKK
   VLGAFSDGLAHLDNLKGTFATLSELHCDKLHVDP
   ENFRLLGNVLVCVLAHHFGKEFTPPVQAAYQKV
   VAGVANALAHKYH

   a. What is the protein?

   Now paste the following into the Search box:

   VHLTPVEKSAVTALWGKVNVDEVGGEALGRLLV
   VYPWTQRFFESFGDLSTPDAVMGNPKVKAHGKK
   VLGAFSDGLAHLDNLKGTFATLSELHCDKLHVDP
   ENFRLLGNVLVCVLAHHFGKEFTPPVQAAYQKV
   VAGVANALAHKYH

   b. How does this amino acid sequence differ from the one in question 6?
   c. What disease is caused by this protein?

7. How long has IAPV been in the United States? ARS

8. Browse the sites on careers in biology. What new career(s) did you learn about?

9. Identify (or come as close as you can to) this organism.

10. Identify (or come as close as you can to) this cell.

11. Identify (or come as close as you can to) this cell.