Dr. Reichler's Bio 301L Take-Home #1 KEY due 2/18/11

1. It is possible to use the amino acid sequence of a protein to determine the DNA sequence of the gene's coding region. Use this amino acid sequence to determine the **DNA sequence**. Show all of the intervening steps, and both strands of DNA. The genetic code can be found below. (5 pts)

Ile, Tyr, Ser, Gly, Asp, Ala, Gln, Asn, Val, Cys

Many possible answers, only one strand of mRNA and then two complementary DNA strands.

2. Should chimpanzees be extended human rights? Give one reason that they might deserve human rights and one reason that they would not deserve human rights. Each answer should include some facts to support your reason. (10 pts)

Varied answers. Need solid facts about intellectual abilities, emotional state, and/or economic reasons for granting, or not granting, human rights.

3. Under normal circumstances, cellular membranes contain lipid rafts. These are small areas of membrane that are solid. Do these lipid rafts contain mostly saturated or unsaturated phospholipids? Why? (5 pts)

Saturated. Saturated phospholipids are more likely to pack together and form a solid.

4. Give **three** differences between totipotent and pluripotent cells. (6 pts)

Any three of: Totipotent can become any kind of cell while pluripotent can only become some kinds of cell. Totipotent have not irreversibly packaged their DNA while pluripotent has some of their DNA irreversibly packaged. Totipotent cells are found only in very early embryos while pluripotent are found in later stage embryos and adults.

5. In what part of a cell would you find the SRY protein? Why is it in this part of the cell? (4 pts)

The SRY protein signals other genes to express and produce proteins. To do this it needs to interact with those genes' promoters. So it will be found in the nucleus.

6. Find a research article, written by the people who did the research, relating to one of the topics that we have discussed in class.

A) Include the citation for the article (article title, author(s), journal title, volume and page number, and date of publication).

B) Describe the question being asked by the researchers. Even though the answer may be hard to understand, but you should be able to understand the question they are asking.

C) Explain how this article relates to one of the topics from class. Be clear about what class topic this article relates to, and how they are related. (10 pts)

Many possible answers. Must be a research article, and have some relevance to class topics (strong inference, definition of life, biomolecules, genes and gene expression, development, transposons, nature/nurture, etc.)

Must have signature, or will not be graded.