

Dr. Reichler's Bio 309D Take-Home #1 Due 2/22/11 at 8am in class: KEY

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)

Ala, Asp, Met, Gly, Arg, Ser, Tyr, Ile, Glu, Pro

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

2. Should chimpanzees have 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. A) Where in a human cell would you find a protein acting as an enzyme? Why is it needed in this part of the cell? B) Where in a human cell would you find a protein acting as structural support? Why is it needed in this part of the cell? (4 pts)

A) Many answers such as: Membranes to change sat to unsat lipids. Nucleus for DNA replication or transcription. Mitochondria to make energy...

B) Many answers such as: Cytoskeleton in cytoplasm or nucleus. Plasma membrane interacting with cytoskeleton. Extracellular matrix...

4. Humans are evolving via natural selection. Looking 10,000 years into the future, describe one human trait that will be different. How will the trait be different, and why will it have evolved via natural selection? (5 pts)

Many answers, must include factual or solid reasons, such as: Sickle-cell gone as malaria cured.

Resistance to diseases like HIV/AIDS. Ability to produce all 20 amino acids as move away from meat-based diet. Loss of traits like red hair, etc...

5. Over the last decade some doctors and drug companies have practiced race-based medicine. This involves targeting certain drugs and/or treatments to patients based on their race. Is this a sound medical approach? What are the benefits, and what are the drawbacks to race-based medicine? Each answer should include some facts to support your reason. (6 pts)

Benefits- drugs and treatments tailored to each individual based on shared genetic and environmental background.

Drawbacks- There is no genetic basis of race, so the assumptions based on someone's ideas of lineage and based on appearance are often wrong.

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. (10 pts)

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.

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, evolution, nature/nurture, etc.)

****Must have signature, or will not be graded.****