Quiz and Survey

This quiz/survey was given to each student at the end of the course. The first 52 questions are true/false questions that were also part of the pre-course quiz. Each of the 52 questions was categorized into one of the five course objectives (Metabolism, Protein Structure-Function, Mutation, Central Dogma, Genetic Code). The last portion (questions 53-75), administered only at the end of the course, was a survey to yield student feedback about the course and lab.

Question 1: A blockage in one of the steps of a series of chemical reactions can occur as the result of a mutation. MET

Question 2: A blockage in one of the steps of a series of chemical reactions will result in the accumulation of the product of the previous chemical reaction. MET

Question 3: A blockage in the second step of a series of four chemical reactions carried out by a cell will have no effect on that cell because the third and fourth steps can still take place. MET

Question 4: A gene can be made of DNA, RNA, or protein CDOG

Question 5: A gene can have a different sequence of nucleotides in different individuals in a species. MUT

Question 6: A gene can specify the production of a protein that is essential for the survival of the organism. MUT

Question 7: A gene has a nucleotide sequence that specifies the production of a particular protein. CDOG

Question 8: A gene is a protein that can either be used to make a corresponding DNA molecule or RNA molecule. CDOG

Question 9: A gene is made from the amino acid sequence information in a protein. CDOG

Question 10: A gene requires RNA as an intermediate molecule to specify the production of a protein. CDOG

Question 11: A gene specifies the production of a particular lipid; the lipid then allows for DNA replication. CDOG

Question 12: A group of three nucleotides in a gene can specify more than a single amino acid in the corresponding protein. CDOG

Question 13: A mutation that changes the number of nucleotides in a gene will sometimes have a dramatic effect and in other cases may have no effect. MUT

Question 14: A protein can be made of DNA, RNA, or amino acids. STRFUN

Question 15: A protein can either perform a function with high efficiency or it cannot perform the function at all.STRFUN

Question 16: A protein can have impaired function as a result of a single amino acid change in the protein chain. STRFUN

Question 17: A protein can interact with another molecule based on complementarity of shapes, as a key fits a lock.STRFUN

Question 18: A protein has a three dimensional shape that can be altered by the environment (for example, pH, temperature).STRFUN

Question 19: A protein has a three dimensional shape that is dependent on the sequence of amino acids. STRFUN

Question 20: A protein has the ability to carry out a specific function that is not dependent on its three dimensional shape. STRFUN

Question 21: All amino acid side chains have similar chemical properties. STRFUN

Question 22: All proteins are long, extended structures that can use the chemical energy of ATP to do work. STRFUN

Question 23: An enzyme can carry out a large number of different functions (tasks) and therefore if one particular enzyme is defective than other enzymes will be able to compensate.MET

Question 24: As a result of a single mutation in a single gene, the corresponding protein could be dramatically changed, for instance be 1/10th the size. MUT

Question 25: Because proteins are nucleotides that are coupled together, proteins show the property known as base-pairing. STRFUN

Question 26: Because some amino acids are structurally more complex than others, they must be encoded by a greater number of nucleotides.CODE

Question 27: Because the bases adenine (A) and thymine (T) base-pair with each other a mutation from an A to a T will have no consequence. MUT

Question 28: Because the code works in groups of three bases (codons) and there are four different types of bases, there are a total of 64 different codons CODE

Question 29: Because there are four different bases in the DNA there are a total of four different genetic codes. CODE

Question 30: Chemical reactions can build molecules such as amino acids and nucleotides and can break down macromolecules. MET

Question 31: Enzymes can catalyze (speed up) a chemical reaction. MET

Question 32: Genes mutate in order for an organism to survive new environmental conditions. MUT

Question 33: Given the information of the amino acid sequence of a protein one can unambiguously determine the base sequence of the corresponding gene. CODE

Question 34: Given the information of the sequence of bases of a gene, one can unambiguously know what the amino acid sequence of the corresponding protein is. CODE

Question 35: If enough of a chemical reactant accumulates it will spontaneously and swiftly be converted to the product, even in the absence of an enzyme. MET

Question 36: In the absence of environmental insults such as high levels of ultra-violet light or X-rays, mutation will not occur. MUT

Question 37: Larger genes have the capability of encoding larger proteins. CODE

Question 38: Mutation is defined as a change in the chemical composition of a protein. MUT

Question 39: Mutation, because it can change the properties of an organism, is bad (it will tend to decrease the likelihood that the species will survive). MUT

Question 40: Mutations can result in a change in the sequence of bases that make up a gene or a change in the number of bases that make up the gene. MUT

Question 41: Proteins are made either directly from the information in DNA or directly from information in an RNA molecule. CDOG

Question 42: Some biological variation can be explained by mutation. MUT

Question 43: The enzyme that catalyzes a chemical reaction is itself consumed (chemically altered or used up) by the reaction. MET

Question 44: The genetic code is based upon reading of nucleotides in groups of three. CODE

Question 45: The genetic code is different for different species of plants and animals. CODE

Question 46: The genetic code refers to the ability of the genes of an organism to code for the traits of the organism. CODE

Question 47: The genetic code works by the pairing of hydrophobic nucleotides with hydrophobic amino acids and the pairing of hydrophilic nucleotides with hydrophilic amino acids. CODE

Question 48: The inability to carry out a series of chemical reactions can lead to an overt (visible) change in the organism. MET

Question 49: Transcription refers to the process of making an RNA molecule that is based on the sequence of bases in a DNA molecule. CDOG

Question 50: Transfer RNA (tRNA) allows for the transfer of information from RNA to protein. CDOG

Question 51: Translation refers to the process of building an RNA molecule based on the information present in a protein.CDOG

Question 52: Working together, a series of chemical reactions can result in the production of important biological "building blocks" such as purine and pyrimidine bases. MET

The next 20 questions are survey questions where we would like to get your feedback on issues about the course. Many of the questions revolve around the project that you did in the first five weeks of the lab period (sometimes referred to as the From Genes to Proteins to Behavior Project).

Question 53: The five week project studying the red and white yeast (this project has also been referred to as From Genes to Proteins to Behavior, or FGPB) helped me to understand the Central Dogma---how information "flows" from DNA to RNA to protein.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 54: The five week project (FGPB) helped me understand how the sequence of nucleotides in a gene provides the information to make a protein.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 55: The five-week project (FGPB) helped me understand how the sequence of amino acids of a protein determines the structure of the protein and to recognize the relationship between the structure of a protein and its function.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree

* 5 Strongly Disagree

Question 56: The five-week (FGPB) project helped me understand mutation, its random nature, and the relationship between mutation and variation.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 57: The five-week project (FGPB) helped me understand how a series of chemical reactions, each one catalyzed by a specific enzyme, can result in the production of essential "building blocks" of the cell and to understand the consequences of an inability to carry out one of the chemical reactions in the series.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 58: The five-week project helped me understand the dependence of protein function on amino acid sequence.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 59: The laboratory period in which we did the polymerase chain reaction helped me understand how DNA replication works.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 60: The five-week project helped me understand that simple organisms can be studied to understand universal biological problems.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 61: The five-week project helped me understand how scientists can understand biological processes even when they are too small to see by eye.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 62: The five-week project helped me learn useful laboratory techniques.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 63: The pace of the five week project was suitable; the concepts were not covered too quickly or too slowly.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 64: Writing the lab report helped me to better understand how the various parts of the lab fit together.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 65: The expectations for the lab report were made clear.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 66: The preview of how the genetic code works helped me understand this concept when it was re-introduced later in the course.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 67: The first laboratory period in which we exposed yeast to ultraviolet light was helpful in advancing my understanding of biology.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 68: The first and second laboratory period (week 1) in which we learned sterile technique and other microbiology techniques was helpful in advancing my understanding of biology.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 69: The third laboratory period in which we purified DNA from the red strain of yeast was helpful in advancing my understanding of biology.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 70: The fourth laboratory period in which the polymerase chain reaction was used to make many copies of the ADE1 and ADE2 genes was helpful in advancing my understanding of biology.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 71: The fifth laboratory period in which the computer was used to analyze the base sequence of DNA from the red and white types of yeast was helpful in advancing my understanding of biology.

* 1 Strongly Agree
* 2 Agree
* 3 Neutral
* 4 Disagree
* 5 Strongly Disagree

Question 72: What was the best thing about this five-week project?

Question 73: What was the worst thing about the five week project?

Question 74: Please include any additional comments concerning the laboratory periods that you wish to add.

Question 75: Please comment on how (or if) you used blackboard for Biology 131 and how the instructors use of blackboard might be improved.