

PROGRAM SLO ASSESSMENT REPORT, SCC

Department: Biology Course: Biology 211 – Cellular and Molecular Biology

Year: 2012

Semester: Fall

| 1) Outcome to be assessed | 2) Means of assessment and criteria of success | 3) Summary of data collected | | | 4) Analysis of data | 5) Plan of action/ what to do next |
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| <p>Demonstrate a coherent understanding of the characteristic themes that pervade and unify the discipline of biology.</p> | <p>A set of 9 multiple choice questions given as an independent assessment in the laboratory during the 16th week of the semester prior to a review session for the lecture final exam.</p> <p>The success of understanding the fundamental biological concepts in each topic area will be assessed by comparison of the actual percentage of correct student</p> | <p>Category</p> <p>Characteristic of life – Organization</p> <p><u>Difficulty:</u> Moderate</p> | <p>Question</p> <p>The four primary elements making up roughly 96% of the macromolecules in living things: a. Nitrogen, Sodium, Chlorine, Selenium, b. Carbon, Hydrogen, Oxygen, Nickel, c. Carbon, Sulfur, Phosphorus, Iron, d. Hydrogen, Oxygen, Carbon, Water, e. None of the above</p> | <p>Data</p> <p>Total # responses 34</p> <p># correct responses 25</p> <p>% correct responses 73.5%</p> | <p>The observed percentages of correct responses for the “moderate” difficulty level questions are significantly and consistently higher than those for the “challenging” difficulty level questions as expected.</p> <p>The percentages of correct responses to all “moderate” and to most of the “challenging” difficulty level questions are significantly higher than minimally expected. The percentage of</p> | <p>I plan to include some “Easy” difficulty level questions to this assessment tool for the next round of data gathering. Data collection will continue in Spring of 2013.</p> |
| | | <p>Characteristic of life – Organization</p> <p><u>Difficulty:</u> Moderate</p> | <p>Chloroplasts are found only in plant cells, whereas Mitochondria are found only in animal cells. a. True b. False</p> | <p>Total # responses 34</p> <p># correct responses 27</p> <p>% correct responses 79.4%</p> | | |
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| <p>responses to the expected percentage. “Success” will be defined here as the ability of the class to provide the following expected percentages of correct responses:</p> <p>For “Easy” questions, 80% (or more) is expected.</p> <p>For “Moderate” questions, 50% (or more) is expected.</p> <p>For “Challenging” questions, 20% (or more) is expected.</p> | <p>Characteristic of life – Organization</p> <p><u>Difficulty:</u> Moderate</p> | <p>Which of the following is TRUE regarding the primary (1°) structure of a protein?</p> <p>a. It only involves ionic bonds b. It is the result of bonds formed between the side groups of the protein c. It results in the formation of “coils” (alpha helix) and “ribbons” (beta pleated sheets) d. It is the result of bonds formed between two or more individual amino acid chains e. It is defined as the specific sequence of amino acids in the protein</p> | <p>Total # responses 34</p> <p># correct responses 24</p> <p>% correct responses 70.6%</p> | <p>correct responses to one of the “challenging” type questions was lower than minimally expected. This specific question is typically missed if a student does not read the entire question carefully.</p> <p>Compared to data collected in Fall 2011, this class in general performed better on the more difficult questions, but did not do as well on the moderate level questions.</p> <p>Overall, the performance of class from both semesters based on this assessment tool is similar and satisfactory.</p> |
| | <p>Characteristic of life – Organization</p> <p><u>Difficulty:</u> Challenging</p> | <p>Hemoglobin, which has a complete functional structure when a total of <u>four amino acid chains</u> (subunits) are attached to one another, is an example of a protein that has which of the following levels of protein structure?</p> <p>a. Primary structure b. Secondary structure c. Tertiary structure d. Quaternary structure e. All of the above</p> | <p>Total # responses 34</p> <p># correct responses 16</p> <p>% correct responses 47.1%</p> | |
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| | | <p>Characteristic of life – Organization</p> <p><u>Difficulty:</u> Moderate</p> | <p>Which of the following statements regarding the structure of DNA is <u>NOT</u> true?</p> <p>a. A DNA molecule naturally exists as two DNA strands twisted together in a double helix</p> <p>b. The two strands of DNA run antiparallel to one another: one 5' → 3' and the other 3' → 5'</p> <p>c. The two DNA strands are held together by hydrogen bonds between the nitrogenous bases</p> <p>d. Each DNA nucleotide is joined to another by a peptide bond</p> <p>e. DNA is circular in Prokaryotic cells and linear in Eukaryotic cells</p> | <p><u>Total # responses</u> 34</p> <p><u># correct responses</u> 24</p> <p><u>% correct responses</u> 70.6%</p> | | |
| | | <p>Characteristic of life – Organization</p> <p><u>Difficulty:</u> Moderate</p> | <p>When complementary base pairing occurs between the nucleotides of the two strands of DNA, Thymine will form _____ with its complement, while Cytosine will form _____ with its complement.</p> <p>a. 2 ionic bonds, 3 ionic bonds</p> <p>b. 3 hydrogen bonds, 2 hydrogen bonds</p> <p>c. 2 hydrogen bonds, 3 hydrogen bonds</p> <p>d. 3 covalent bonds, 2 covalent bonds</p> <p>e. 2 covalent bonds, 3 covalent bonds</p> | <p><u>Total # responses</u> 34</p> <p><u># correct responses</u> 30</p> <p><u>% correct responses</u> 88.2%</p> | | |

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| | | <p>Characteristic of life – Organization</p> <p><u>Difficulty:</u> Challenging</p> | <p>The structure of the thylakoid membrane is best described as being composed of numerous independent chlorophyll A and chlorophyll B molecules homogenously distributed among cytochrome proteins and ATP synthase protein complexes imbedded in a bilayer of phospholipids shaped into flat disk with a hollow center.</p> <p>a. True b. False</p> | <p>Total # responses 34</p> <p># correct responses 6</p> <p>% correct responses 17.6%</p> | | |
| | | <p>Characteristic of life – Organization</p> <p><u>Difficulty:</u> Moderate</p> | <p>The model organism known as <i>Caenorhabditis elegans</i> is useful in the study of development because</p> <p>a. Numerous “knockout” experiments on this organism has identified the function of many of its genes b. It has revealed how sex is determined in species with 2 sexes c. Its transparent body allows us to watch every cell differentiate from one cell into all of the body cells d. Genes known as egg-polarity genes were first discovered in it e. It serves as a starting point for discovering the genetic controls for the development of all plants</p> | <p>Total # responses 34</p> <p># correct responses 26</p> <p>% correct responses 76.5%</p> | | |
| | | <p>Characteristic of life – Organization</p> <p><u>Difficulty:</u> Challenging</p> | <p>Which of the following correctly describes the hierarchy of DNA organization in Eukaryotic cells?</p> <p>a. Double Helix → Nucleosomes → Chromatin fibers → Looped Domains → Chromosome b. Double Helix → Looped Domains → Nucleosomes → Chromosome → Chromatin fibers c. Nucleosomes → Double Helix → Chromatin fibers → Looped Domains</p> | <p>Total # responses 34</p> <p># correct responses 16</p> | | |

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| | | | <p>→ Chromosome d. Nucleosomes → Looped Domains → Double Helix → Chromatin fibers → Chromosome e. Chromatin fibers → Looped Domains → Nucleosomes → Chromosome → Double Helix</p> | <p>% correct responses 47.1%</p> | | |
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