Course SLO Assessment Report - 4-Column

El Camino College

El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology)

Course SLOs	Assessment Methods & Standard and Target for Success / Tasks	Results	Action & Follow-Up
El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology) - ECC: ANAT 30 - Essentials of Anatomy and Physiology - SLO #3 Structures - Students will be able to identify higher vertebrate body structures, and explain the functions of body systems. (Created By El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology)) **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013 **Course SLO Status:** Active	**Assessment Method Description:** Three objective multiple choice questions were given during the course of the semester which assessed student understanding of cell structures and functions. **Assessment Method:** Exam/Test/Quiz **Standard and Target for Success:** Rubric: Level 1: Students can answer one question about cell structure and transport. Level 2: Students can answer two questions about cell structure and transport. Level 3: Students can answer all three questions about cell structure and transport. Based on the Rubric, it is expected that 65% of the students will score at a Level 2 or above on this SLO. For each of the individual questions, it is expected that 65% or greater of students assessed should get each question correct. Students will be given the following three multiple choice questions incorporated in quizzes or exams to assess student understanding of cell structure and functions. 1. Red Blood cells are observed under the microscope, then a 20% saline solution is added to them. Which of the following would you expect to see? A) The cells would swell up and lyse B) The cells would crenate C) The cells would look the same as before the saline solution was added D) The cells would turn inside out E)?he cells would dance the Macarena 2. In Tay-Sachs disease, glycolipids build up in nerve cells and cause neuronal death because the organelle that normally degrades the glycolipids is nonfunctional. Which of the following 5 organelles is responsible for this disease? A) Mitochondria B)Smooth Endoplasmic Reticulum C) Peroxisomes D) Lysosomes E) Golgi Apparatus 3. The phospholipids of a cellular membrane will have their _____ ends facing each other and their _____ ends facing either the intracellular	08/30/2014 - Results: The SLO results of individual questions answered by 49 students, in three sections of the Anatomy 30, were as follows: Question 1: Answered A (42.9%) Answered B (44.%) - correct answer Answered C (10.2%) Answered D (2.0%) Answered E (0.0% Question 2: Answered A (0.0% Answered B (20.4%) Answered C (24.5%) Answered D (42.9%) correct answer Answered E (12.2%) Question 3: Answered A (4.1%) Answered B (8.2%) Answered C (36.7%) Answered D (51%) correct answer Answered E (0.0%) In reference to the rubric, 42.9% of the students in the three sections of Anatomy 30 were successful and met the standard of success, by answering two or more questions correctly (level 2 or above). Only 32.7% of students answered two questions correctly(level 2) and 10.2% of the students answered all three questions correctly(level 3). This was below the 65% target for success for the rubric level 2 or above. Also, the target for success (65% correct answer) for each question of this SLO was not met by the three sections of Anatomy 30 students. Question #1, assesses the knowledge and understanding of osmosis and the effect of osmotic pressure on red blood cells. The target for success(65%) was not met, with only 44.9% of the students choosing the correct answer B, the cells would crenate/shrink. The majority of students missed this question by answering A (42.9%), the cells would swell up and lyse, which described the opposite effect of	03/27/2015 - The target for success(65%) was not met for SLO 3 Cell Structure: Students will be able to identify higher vertebrate body structures, and explain the functions of body systems. Question #1, only 44.9% of the students answered the question correctly. The majority of students who missed the question (42.9%), did not clearly understand the concept of osmosis. These students gave the wrong answer A, the cell will swell up and lyse, which described the opposite effect of the correct answer B, the cells would crenate/shrink in a hypertonic environment. One new teaching strategy that I would like to include as an additional laboratory experiment, would include using living cells to demonstrate the effects of osmotic shock. Currently in my class, we utilize semipermeable plastic bags placed into various saline solutions, to demonstrate principles of osmosis. I feel that students observing the effects of osmotic shock with living cells, would enhance their understanding and retention of the principles of osmosis. Also, I plan to spend additional time in lecture and laboratory, further explaining the basic concepts of osmosis, utilizing worksheets, homework problems and diagrams. Question #3, the target for success(65%) was not achieved, with 51% of students answering the question correct. This question required students to understand basic terminology and physiology of the cell membrane. Since the majority of students(36.7%) who missed this question, were confused with the terminology, hydrophobic/ hydrophilic, and chose the opposite answer. Some actions that could be

Course SLOs	Assessment Methods & Standard and Target for Success / Tasks	Results	Action & Follow-Up
	Related Documents: Anat30CellSLO#3Data.xls	placing a cell in a hypertonic solution. It appears that the majority of students were confused with the terminology and concept of osmosis and gave the opposite effect as an answer. Only a small percentage of students (12.2%) demonstrated a lack of complete understanding knowledge of osmosis and answered C (10.2%), the cells would look the same or D (2%), the cells would turn inside out. For question #2, again the target of success(65%) was not achieved, with 42.9% of students answering the correct answer D (lysosome). Question 2 assesses the student's ability to understand the specific function of lysosome organelles within a cell and preventing Tay-Sach's disease. The data indicates that a significant number of students gave the wrong answer and chose C (24.5%), peroxisomes, and B (20.4%), smooth endoplasmic reticulum. These cell organelles have different functions, compared to the correct answer C, lysosomes. However, question 2 was written in such a way that some students may have been confused by the wording and this may have contributed to the low correct answer (42.9%). Question #3 assess the ability of students to understand basic terminology and physiology of a cell membrane. The target for success(65%) was not met, only 51% of students gave the correct answer D, hydrophobic; hydrophilic. The data indicates that a substantial number of students (36.7%) answered the wrong answer C, hydrophilic; hydrophobic, and not the correct answer D. It appears that these student may have confused the terminology. The scientific terms hydrophobic and hydrophilic have completely opposite meanings and appears that 36.7% of students, confused these terms. **Standard Met? :** No **Semester and Year Assessment Conducted:** 2013-14 (Spring 2014) **Faculty Assessment Leader:** Michael Stupy **Faculty Contributing to Assessment:** Maragaret Steinberg, Thomas Noyes **Related Documents:** Anat30CellSLO#3Data.xls	employed would be to assign homework problems focusing on terminology and the interactions of hydrophobic and hydrophilic molecules of the cell membrane. In addition, an in-class worksheet assignment and study guide, focusing on the physiology of a cell membrane, specifically regarding lipid and water molecules interactions, would enhance student learning. **Action Category:** Teaching Strategies 03/27/2015 - Question #2, the target for success(65%) was not achieved, only 42.9 of the students answered the question correctly. A significant number of students marked the wrong answers B(20.4%) and C(24.5%), for the function of lysosome organelles(correct answer D). By modifying the assessment tool and removing peroxisomes(answer C), which have similar functions as lysosomes and replacing it with ribosomes for question #2, may reduce confusion of the correct answer lysosomes. I feel that this will increase student success substantially. Also, I expect to spend additional time in class with students utilizing models, assigning extra homework worksheets, to increase their knowledge and **Action Category:** SLO/PLO Assessment Process
El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology) - ECC: ANAT 32 - General	**Assessment Method Description:** 1. Red blood cells are observed under a microscope, then a 20% saline solution is added	09/12/2014 - Question 1: Answered A – 23.1% Answered B – 66.7% (Correct Answer)	09/12/2014 - Incorporate practice assignments to ensure student mastery of membrane transport mechanisms

Course SLOs	Assessment Methods & Standard and Target for Success / Tasks	Results	Action & Follow-Up
Human Anatomy - SLO #3 Structures - Students will be able to identify higher vertebrate body structures of all body systems. (Created By El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology)) **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013 **Course SLO Status:** Active	to them. Which of the following would you expect to see? A) The cells would swell up and lyse B) The cells would crenate C) The cells would look the same as before the saline solution was added D) The cells would turn inside out E) The cells would dance the Macarena 2. In Tay-Sachs disease, glycolipids build up in nerve cells and cause neuronal death because the organelle that normally degrades the glycolipids is nonfunctional. Which one of the following 5 organelles is responsible for this disease? A) Mitochondrion B) Smooth Endoplasmic Reticulum C) Peroxisomes D) Lysosomes E) Golgi Apparatus 3. The phospholipids of a cellular membrane will have their ____ends facing each other and their _____ ends facing either the intracellular or extracellular space. A) hypotonic; hypertonic B) hypertonic; hypotonic C) hydrophilic; hydrophobic D) hydrophobic; hydrophilic E) hypotonic; hydrophobic **Assessment Method:** Exam/Test/Quiz **Standard and Target for Success:** Level 1 Student can answer one question about cell structure and transport. Level 2 Student can answer two questions about cell structure and transport. Level 3 Student can answer all three questions about cell structure and transport.	Answered C – 5.1% Answered D – 2.6% Valle_SLO_Report_Template-2014-01Jan-23 (2).doc Rev 11.29.2013 IP Answered E – 0.0% For this question the standard was met, 66.7% of the students answered the question correctly. The most common incorrect answer marked was A (23.1%), which in biological terminology is the opposite effect of the correct answer. This is a common misconception for some students who are unsure of the direction of the osmosis of water molecules. Question 2: Answered A – 5.0% Answered B – 2.6% Answered C – 20.5% Answered D – 74.4% (Correct Answer) Answered E – 0.0% For this question the standard was met. Students that missed the question answered with several different organelles, but the most common incorrect answer marked was C (20.5%). Peroxisomes are organelles that have a similar function as lysosomes and will often be confused by some students. Question 3: Answered A – 5.1% Answered B – 0.0% Answered C – 12.8% Answered D – 79.5% (Correct Answer) Answered E – 0.0% For this question the standard was met. The majority of students that missed the question answered C (12.8%), in which case they were confused between the terms hydrophobic (water-hating) and hydrophilic (water-loving). Results for Total Question Assessment: Level 3: Answered 3 Correct – 27.50% (Excellent, meets the standard) Level 2: Answered 2 Correct – 45.00% (Satisfactory, meets the standard) Level 1: Answered 1 Correct – 20.00% (Unsatisfactory, does not meet the standard) For the total assessment the standard was met. The vast majority of students, 89.7% passed with a level 2 or higher. These students had “Excellent” or “Satisfactory” understanding of the assessed material, which met the criteria of getting 2 or more of the 3 questions correct. Of the 89.7% of students that met the standard, 35.9% were in the “Excellent” category and 53.8% were in the “Satisfactory” category and the remaining 7.7% of the students **Standard Met? :** Yes **Semester and Year Assessment Conducted:**	including drawing out and labeling examples of cells in a hypertonic vs hypotonic environment and their response (i.e. lysis in a hypotonic solution vs crenation in a hypertonic solution). **Action Category:** Teaching Strategies 09/12/2014 - Request funding for supplemental instruction and more tutoring. El Camino services many students not prepared for college courses especially in the sciences. **Action Category:** Program/College Support 09/12/2014 - Addition of level 0 for those students who did not answer any of the assessment questions correctly. This will help identify struggling students that may require more hands on instruction. **Action Category:** SLO/PLO Assessment Process 09/12/2014 - Design practice problems to ensure mastery of membrane transport and osmosis concepts by comparing cells respnse when they are placed in a hypotonic solution vs a hypertonic solution. Have the students draw and show the movement of water molecules in a hypotonic solution vs a hypertonic solution. **Action Category:** Teaching Strategies 02/02/2015 - El Camino services many students who are under prepared for the rigor of college courses especially in the sciences. Request for more funding for supplemental instruction and tutors would help students achieve their academic goals. **Action Category:**

Course SLOs	Assessment Methods & Standard and Target for Success / Tasks	Results	Action & Follow-Up
		2013-14 (Spring 2014) **Faculty Assessment Leader:** Anne Valle **Faculty Contributing to Assessment:** Margaret Steinberg, Jim Noyes **Related Documents:** ProgramCellSLOData.xls	Program/College Support 02/08/2016 - Add an additional level of 0 to identify struggling students who do not understand any of the concepts being taught. **Action Category:** SLO/PLO Assessment Process
El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology) - ECC: APHY 34A - Anatomy and Physiology I - SLO #3 Structures - Students will be able to identify structures of the integumentary, skeletal, muscular, and nervous systems, in addition to explaining the functions of the systems. (Created By El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology)) **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013 **Course SLO Status:** Active	**Assessment Method Description:** 1. Red blood cells are observed under a microscope, then a 20% saline solution is added to them. Which of the following would you expect to see? A) The cells would swell up and lyse B) The cells would crenate C) The cells would look the same as before the saline solution was added D) The cells would turn inside out E) The cells would dance the Macarena 2. In Tay-Sachs disease, glycolipids build up in nerve cells and cause neuronal death because the organelle that normally degrades the glycolipids is nonfunctional. Which one of the following 5 organelles is responsible for this disease? A) Mitochondrion B) Smooth Endoplasmic Reticulum C) Peroxisomes D) Lysosomes E) Golgi Apparatus 3. The phospholipids of a cellular membrane will have their ____ends facing each other and their _____ ends facing either the intracellular or extracellular space. A) hypotonic; hypertonic B) hypertonic; hypotonic C) hydrophilic; hydrophobic D) hydrophobic; hydrophilic E) hypotonic; hydrophobic **Assessment Method:** Exam/Test/Quiz **Standard and Target for Success:** Level 1 Student can answer one question about cell structure and transport. Level 2 Student can answer two questions about cell structure and transport. Level 3 Student can answer all three questions	09/09/2014 - Based on the rubric of students answering 2 or more questions correctly at 65%, Anatomy and Physiology 34A fell short at 63.4%. The slightly lower percentage of students successfully mastering cell structure and function may be due to the fact that this course has no prerequisite of a life science course. This course only has a prerequisite course of Chemistry. The students in this course may not have learned all the analytic skills required to reason and deduce the correct answer pertaining to life science materials. For Question # 1, only 59.6% of the students answer this question correctly. The goal is 65% of the students will answer this question accurately. The students may not have known the definition of some terms to appropriately deduce the answer. For Question # 2, again 59.6% of the students answer this question correctly with a goal of 65%. The students may not have been able to recognize the basis of what the question was asking for. The students may have been confused with the disease incorporated into the question. **Standard Met? :** No **Semester and Year Assessment Conducted:** 2013-14 (Spring 2014) **Faculty Assessment Leader:** Thanh-Thuy Bui **Faculty Contributing to Assessment:** Margaret Steinberg **Related Documents:** Anatomy 34 A SLO Assessment Data.doc	05/01/2015 - Incorporate more activities on learning terms. **Action Category:** Teaching Strategies 11/01/2016 - Reword the questions to be less ambiguous. **Action Category:** SLO/PLO Assessment Process

Course SLOs	Assessment Methods & Standard and Target for Success / Tasks	Results	Action & Follow-Up
	about cell structure and transport.		
El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology) - ECC: APHY 34B - Anatomy and Physiology II - SLO #3 Structures - Students will be able to identify structures of the nervous, endocrine, circulatory, respiratory, digestive, urinary, and reproductive systems, in addition to explaining the functions of the systems. (Created By El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology)) **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013 **Course SLO Status:** Active	**Assessment Method Description:** 1. Red blood cells are observed under a microscope, then a 20% saline solution is added to them. Which of the following would you expect to see? A) The cells would swell up and lyse B) The cells would crenate C) The cells would look the same as before the saline solution was added D) The cells would turn inside out E) The cells would dance the Macarena 2. In Tay-Sachs disease, glycolipids build up in nerve cells and cause neuronal death because the organelle that normally degrades the glycolipids is nonfunctional. Which one of the following 5 organelles is responsible for this disease? A) Mitochondrion B) Smooth Endoplasmic Reticulum C) Peroxisomes D) Lysosomes E) Golgi Apparatus 3. The phospholipids of a cellular membrane will have their ____ends facing each other and their _____ ends facing either the intracellular or extracellular space. A) hypotonic; hypertonic B) hypertonic; hypotonic C) hydrophilic; hydrophobic D) hydrophobic; hydrophilic E) hypotonic; hydrophobic **Assessment Method:** Exam/Test/Quiz **Standard and Target for Success:** For each of the 3 individual questions, 65% or greater of students assessed should get the question correct. The questions are considered either correct or incorrect based on the multiple choice letter selected. For the total assessment, 65% or greater of students should get 2 or more of the questions correct (i.e. rubric Level 2 or higher). Level 1 Student can answer one question about cell structure and transport. Level 2 Student can answer two questions about	09/08/2014 - The results indicate that 37.1% of students assessed answered 1 of 3 questions correctly and only 47.5% answered 2 or more questions correctly. With regard to individual questions, 49-55% of students answered each question correctly. Thus, our goal of 65% was not achieved in this course. Question 1 is a knowledge question that test students' vocabulary and understanding of osmosis as affected by tonicity. In most courses one common mistake students experienced was to confuse the response of a cell when exposed to hypertonic vs hypotonic solutions. The incorrect answer selected more often for question 1 (answer A at 34%) indicates that students confused the reaction of a cell when exposed to a hypotonic solution with that of when exposed to a hypertonic solution. Question 2 is an application question of organelle function. The incorrect answer selected most often (21%) was the mitochondrion. It is possible that students who didn't know the correct answer selected the organelle most often mentioned up to the point of the assessment. In other courses assessed this semester, 8-33% of students selected peroxisome more often as the incorrect answers. Peroxisomes are closely related in function to lysosomes (the correct answer). In courses that had been lectured on cell organelle functions and assessed soon after performance was better than those in A&P 34B. In A&P 34B organelles are not discussed in as much depth as they are in the other courses assessed. Question 3 tests the understanding of structure and function of the plasma membrane and vocabulary. In 34B, question 3 was correctly answered by the highest percentage of students (55%). The incorrect answer selected most often (36%) indicates that students confused the position of the phospholipid molecule in the cell membrane. The answer choices minimally selected indicate that students clearly understood the difference between terminology used indicate tonicity and solubility. **Standard Met? :** No **Semester and Year Assessment Conducted:** 2013-14 (Spring 2014) **Faculty Assessment Leader:** Jessica Padilla **Faculty Contributing to Assessment:**	11/02/2014 - Change the rubric to include a level zero for students who did not get any correct answers. Also, modify question 1 by adding the word "lyse" in parenthesis next to crenate. Students who selected the incorrect answer often selected the cellular response opposite to the correct answer. We assume that the word crenate was not well understood and caused confusion since the word lyse may have been used during instruction or lab rather than crenate. **Action Category:** SLO/PLO Assessment Process 09/15/2015 - Our courses need more support than the current resources being offered. We can request through the proper channels that the college provide funding for Supplemental Instruction and more tutors. The student demand for tutors is great and more availability will help performance as sometimes students don't get to work with a tutor because time runs out. **Action Category:** Program/College Support 09/08/2018 - Spend more time explaining the concepts of osmosis and diffusion. Have student draw the response cells would have when exposed to solutions of different concentrations. Review other organelle functions when discussing the golgi organ and mitochondria. **Action Category:** Teaching Strategies

Course SLOs	Assessment Methods & Standard and Target for Success / Tasks	Results	Action & Follow-Up
	cell structure and transport. Level 3 Student can answer all three questions about cell structure and transport.	Margaret Steinberg **Related Documents:** ProgramCellSLOData.xls	
El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology) - ECC: MICR 33 - General Microbiology - SLO #3 Microbes - Student will be able to identify microbes and explain their roles in health and disease. (Created By El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology)) **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013 **Course SLO Status:** Active	**Assessment Method Description:** Three objective multiple choice questions were given during the course of the semester which assessed student understanding of cell structures and functions through the concepts of cellular damage and disease. The following are the questions that were used: 1. Red blood cells are observed under a microscope, then a 20% saline solution is added to them. Which of the following would you expect to see? A) The cells would swell up and lyse B) The cells would crenate C) The cells would look the same as before the saline solution was added D) The cells would turn inside out E) The cells would dance the Macarena Correct Answer: B 2. In Tay-Sachs disease, glycolipids build up in nerve cells and cause neuronal death because the organelle that normally degrades the glycolipids is nonfunctional. Which one of the following 5 organelles is responsible for this disease? A) Mitochondrion B) Smooth Endoplasmic Reticulum C) Peroxisomes D) Lysosomes E) Golgi Apparatus Correct Answer: D 3. The phospholipids of a cellular membrane will have their ____ends facing each other and their _____ ends facing either the intracellular or extracellular space. A) hypotonic; hypertonic B) hypertonic; hypotonic C) hydrophilic; hydrophobic D) hydrophobic; hydrophilic E) hypotonic; hydrophobic Correct Answer: D **Assessment Method:** Exam/Test/Quiz **Standard and Target for Success:** For the total assessment, 65% or greater of	03/05/2014 - Assessments took place by evaluating 10 random student results from each of the 4 sections that were assessed. This generated 40 total data points for each of the individual questions assessments and for the total question assessment. Again, raw data and the specific questions can be found in the attached Excel document file. Results for Total Question Assessment: o Answered 3 Correct – 27.50% (Level 3, meets the standard) o Answered 2 Correct – 45.00% (Level 2, meets the standard) o Answered 1 Correct – 20.00% (Level 1, does not meet the standard) o Answered 0 Correct – 7.50% (No designation, does not meet the standard) For the total assessment the standard was met. The vast majority of students, 72.50% had “Level 2" or “Level 3” understanding of the assessed material, which met the criteria of getting 2 or more of the 3 questions correct. Of the 72.50% of students that met the standard, 37.93% were in the “Level 3” category and 62.07% were in the “Level 2” category. Of the 27.50% of students that failed to meet the standard, 72.72% were in the “Level 1” category and 27.28% were in the undesignated category with 0 correct. Results for Individual Question Assessments: • Question 1: o Answered A – 32.50% o Answered B – 62.50% (Correct Answer) o Answered C – 5.00% o Answered D – 0.00% o Answered E – 0.00% For this question the standard was not met. The vast majority of students that missed the question (32.50%) answered A (osmotic lysis due to swelling), which was in biological terms the opposite effect of the correct answer (plasmolysis/crenation due to loss of water). On a positive note, only 5% of students answered with a response that showed a complete lack of understanding or correlation to the concepts being addressed in the question.	03/27/2015 - For the total assessment, the 65% target for success was met at 72.50% for “SLO#3 Cell Structure: Students will be able to identify higher vertebrate body structures, and explain the functions of body systems”. However, individual questions #1 and #3 failed to meet the standard. For Question #1, only 62.50% of the students answered the question correctly. The 37.50% of students, who missed the question, did not clearly understand the concept of osmosis. 86.67% of the students that gave the incorrect answer described the opposite effect (i.e. the cells would swell up and lyse) versus what would happen to a cell exposed to a hypertonic environment (i.e. the cells would crenate (shrink)). One new teaching strategy that might clarify the confusion would include an additional laboratory experiment with living cells to demonstrate the effects of osmotic shock as it occurs in a hypertonic environment. Currently in class, we grow microorganisms on different concentrations of salt agars to demonstrate the principles of osmosis. However, this is visually limited because the cells are so small you would not see the actual effects at the cellular level. If students observe the effects of osmotic shock microscopically in living cells, this may enhance their understanding and retention of the principles of osmosis. Also, additional emphasis in lecture/laboratory by using a worksheet that emphasizes labeling and cell membrane construction in conjunction with different osmotic pressure scenarios (i.e. hypertonic, isotonic, and hypotonic) might help to prevent the inversion of these concepts.

Course SLOs	Assessment Methods & Standard and Target for Success / Tasks	Results	Action & Follow-Up
	students should get 2 or more of the questions correct (i.e. rubric Level 2 or higher). Rubric: Level 1 = Student can answer one question about cell structure and transport. Level 2 = Student can answer two questions about cell structure and transport. Level 3 = Student can answer all three questions about cell structure and transport. For each of the 3 individual questions, 65% or greater of students assessed should get the question correct. The questions are considered either correct or incorrect based on the multiple choice letter selected. Question 1 assesses the understanding of osmosis and osmotic pressure on red blood cells through their impact on cellular structure. Question 2 assesses the understanding of cellular degradation processes of structures within the cell through the understanding of a disease model. Question 3 assesses the understanding of cellular membrane structure through the understanding of hydrophobic and hydrophilic regions of molecules. **Related Documents:** Micro33 Cell SLO #3 Data	• Question 2: o Answered A – 5.00% o Answered B – 10.00% o Answered C – 7.50% o Answered D – 75.00% (Correct Answer) o Answered E – 2.50% For this question the standard was met. The students that missed the question answered with a several different organelles types within the cell that which were not associated with the process questioned. Perhaps, suggesting further clarification of the structure and function of the included organelles is needed. • Question 3: o Answered A – 5.00% o Answered B – 2.50% o Answered C – 37.50% o Answered D – 55.00% (Correct Answer) o Answered E – 0.00% For this question the standard was not met. The vast majority of students that missed the question (37.50%) answered C, which was in biological terms the opposite effect of the correct answer (i.e. hydrophobic and hydrophilic concepts were inverted). On a positive note, only 7.5% of students answered with a response that showed a complete lack of understanding and correlation to the concepts being addressed in the question. Interpretation: Although the total assessment standard was met, results would be greatly improved by elevating each question to meeting their individual standard. The failures of Question 1 and 3 to meet the individual standard were due to inverting the concepts that were being questioned and not a complete lack of understanding of the concepts that were being questioned. Even Question 2, which met the standard, could show improvement through a clear understanding of the function of each specific organelle within eukaryotic cells. This suggests an emphasis needs to be made on the definitions of the terms used to answer the questions. This would include an improvement in the understanding of the roles of cellular structures and the chemical properties involved that pertain to the concepts in question. **Standard Met? :** No **Semester and Year Assessment Conducted:** 2013-14 (Spring 2014) **Faculty Assessment Leader:** Todd White	For Question #3, only 55.00% of the students answered the question correctly. The 45.00% of students, who missed the question, did not clearly understand the concept of polar versus nonpolar molecules in the cell membrane. 83.33% of the students that gave the incorrect answer used the opposite wording to describe the molecules orientation towards water (i.e. hydrophilic; hydrophobic) versus the correct orientation (i.e. hydrophobic; hydrophilic). The worksheet discussed in the response to Questions #1, which emphasizes labeling and cell membrane construction in conjunction with different osmotic pressure scenarios could be used to understand the hydrophobic and hydrophilic regions of cell membranes and where water can be found in regards to those environments. Another technique would be to emphasize the terms hydrophobic and hydrophilic when discussing the concept of degerming, which deals with how hand washing soap removes oil from skin. Soap is similar to phospholipids in that the molecule has a polar region that is hydrophilic and a nonpolar region that is hydrophobic. Correlating these two concepts may increase retention of what portions of molecules will want to associate with water or not. Question #2, the target for success (65%) was achieved, 75.00% of the students answered the question correctly. Students who missed the question were fairly evenly dispersed throughout the other answers. Organelles are covered during both a PowerPoint lecture and in a video, in addition to being taught in prerequisite classes. I believe the redundancy in classes and through different sources helped the question meet the standard. In the future, scores on the question could be improved through worksheets that include identification and labeling of specific functions for each organelle found in eukaryotic cells.

Course SLOs	Assessment Methods & Standard and Target for Success / Tasks	Results	Action & Follow-Up
		Faculty Contributing to Assessment: Margaret Steinberg; Thomas J. Noyes **Related Documents:** Micro33 Cell SLO #3 Data	**Action Category:** Teaching Strategies
El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology) - ECC: PHYO 31 - Human Physiology - SLO #3 Mechanisms - Students will be able to describe mechanisms and explain physiological processes that occur in the human body on cellular, organ, systemic, and organismal levels. (Created By El Camino: Course SLOs (NSC) - Life Science: Allied Health (Anatomy, Physiology, Microbiology)) **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013 **Course SLO Status:** Active	**Assessment Method Description:** 1. Red blood cells are observed under a microscope, then a 20% saline solution is added to them. Which of the following would you expect to see? A) The cells would swell up and lyse B) The cells would crenate C) The cells would look the same as before the saline solution was added D) The cells would turn inside out E) The cells would dance the Macarena 2. In Tay-Sachs disease, glycolipids build up in nerve cells and cause neuronal death because the organelle that normally degrades the glycolipids is nonfunctional. Which one of the following 5 organelles is responsible for this disease? A) Mitochondrion B) Smooth Endoplasmic Reticulum C) Peroxisomes D) Lysosomes E) Golgi Apparatus 3. The phospholipids of a cellular membrane will have their ____ends facing each other and their _____ ends facing either the intracellular or extracellular space. A) hypotonic; hypertonic B) hypertonic; hypotonic C) hydrophilic; hydrophobic D) hydrophobic; hydrophilic E) hypotonic; hydrophobic **Assessment Method:** Exam/Test/Quiz **Standard and Target for Success:** Level 1 Student can answer one question about cell structure and transport. Level 2 Student can answer two questions about cell structure and transport. Level 3 Student can answer all three questions about cell structure and transport.	09/14/2014 - The collected date indicated that the number of students in the Physiology classes who answered two or more questions correctly was 71.1%. This result not only met but was above the rubric target of 65% of the students. While some courses within the Health Science Program met or exceeded the target, whereas other courses fell short of the target. The students in Physiology 31 exceeded the target level, which is possibly because Anatomy 32 and Chemistry are prerequisites to Physiology 31. With this more extensive background science background, it is likely that this information is repeated in all three courses including Physiology 31. It should be noted that our Rubric will be revised by adding a level 0 for students who can't answer any of the questions correctly, because unfortunately that was the case for some students. In relation to individual answers to the questions posed, while the target of 65% correct answers was not only met and exceeded for the physiology course, a relatively high number of students selected incorrect answers. For example, 9.6% of the students failed to get any correct while another 19.2% selected only one correct answer. In contrast 19.2% of the students answered all three questions correctly. Further analysis showed that in question 1, approximately 23.5% answer choice A (that cells would swell up and lyse in a 20% saline solution), rather than the 61.7% who selected the correct answer B (that cells would crenate). Likewise, for question #2 about the organelle responsible for Tay-Sach's disease, a large percentage of students (27.7%) chose answer C (peroxisomes), rather than the correct answer D (lysosomes) which was selected by 63.8% of the students. Similarly, for question #3 about how phospholipids are arranged in a plasma membrane, a high percentage of students (27.5%) chose answer C (hydrophilic; hydrophobic), rather than the 59.5% that correctly answered D (hydrophobic; hydrophilic). Since a fairly large percent of students selected the same incorrect answers, one might conclude that there was some confusion with the wording of the questions and/or that of the answers, or uncertainty about which answer is correct. In our follow-up our faculty discussed these questions and their answers, and decided to reword the answers to questions 1 and 2.	12/19/2014 - Changes will be made to the Rubric, and to the assessment questions and/or answers. In regard to the Rubric, we will add the choices: "Student answered 0 questions correctly about cell structure and transport." Changes to assessment question answers will include: For question 1, letter B, we will add the word "shrink" in parentheses after crenate. For question 2, we are going to change the letter C answer from "peroxisomes" to "ribosomes." **Action Category:** SLO/PLO Assessment Process 05/29/2015 - We will request that the College provide more qualified tutors to help students understand the topics. **Action Category:** Program/College Support 05/25/2018 - Review assessment topics with students just prior to examinations. To be assessed during the next assessment cycle for the "Application of Health Science Concepts" for the PLO. **Action Category:** Teaching Strategies

Course SLOs	Assessment Methods & Standard and Target for Success / Tasks	Results	Action & Follow-Up
		For question 1, letter B, we will add the word “shrink” in parentheses after crenate, because some of our courses don’t use the word crenate. For question 2, we are going to change the letter C answer from “peroxisomes” to “ribosomes.” Because both peroxisomes and lysosomes are degradative organelles, this change should minimize confusion about the correct answer. For question 3, no change was deemed necessary. Students who chose the answer that was the exact opposite to the one that was correct, clearly didn’t understand the relationship between the nonpolar, hydrophobic fatty acids and polar, hydrophilic phosphates and how they interact in a cell’s plasma membrane. The faculty also shared techniques about how these topics are taught to determine more effective ways of helping students to learn and retain the material. One instructor, whose classes had a relatively high percentage of correct answers, said that she reviewed the question concepts with her students the day before she quizzed them on the information. Although most, if not all, of our faculty provide study guides to their students prior to exams, apparently an in -class review is helpful. **Standard Met? :** Yes **Semester and Year Assessment Conducted:** 2013-14 (Spring 2014) **Faculty Assessment Leader:** Simon Trench	