**General Biology I**
**Cellular Respiration**
**Professor: Yasser Saad, Ph.D.**

**Take Home Assignment: Flowchart and discuss cellular respiration and its significance. Note: Rubric is provided to guide your work. Please use it.**

**Overall Goal:** Produce a well-organized and thorough flowchart of all the cellular events involved in cellular respiration in a EUKARYOTIC cell. Use the supplied rubric to help guide you in developing your flowchart. Subsequently, use your well-organized and thorough flowchart to describe the events and their significance by developing a well-organized and thorough write-up of the cellular process. Use the supplied rubric to help guide you in developing your write-up.

**Due on: 11-7-16**

-The flowchart (neatly hand written/drawn).
-The write-up (neatly hand written in pen). The write-up MUST be in your own words. NO PLAGIARISM. To avoid plagiarism, do your flowchart and then use your own flowchart and describe what is happening in your own words without looking at your book or the internet. Make sure you are thorough in your description. Do not copy from your book or the internet.

**Task:** Flowchart and discuss all the cellular events, along with their cellular locations, that take place when the cell breaks down glucose to produce the important energy molecule Adenosine Triphosphate (ATP). Flowchart and discuss the events based on 1 glucose molecule. Include in your flowchart and discussion the following (DO NOT SIMPLY ANSWER THE FOLLOWING BULLET POINTS, YOU NEED TO ACTUALLY FLOWCHART AND ALSO PRODUCE A WRITTEN DISCUSSION THAT INCLUDES THE NEEDED INFORMATION BUILT IN TO YOUR FLOWCHART AND DISCUSSION):

-The difference in outcome based on the availability of oxygen; when oxygen is present and when oxygen is absent.
-Differences observed in different organisms, more specifically animal and yeast, when oxygen is not present.
-Be specific with regard to what is used during each cellular process.
-Be specific with regard to what is produced during each cellular process.
-Be specific with the name of each event (with and without oxygen).
-Be specific with regard to the cellular location of each event.
-Be specific with regard to how many electron carriers are produced during each event.
-Be specific with regard to which of the events produce carbon dioxide and how many.
-Use proper terms describing each event.
-Account for all the ATPs produced and make sure you include the process that is used to make each ATP.
-Discuss why cellular respiration is important and what benefit is achieved by fermentation.
-Compare and contrast substrate level phosphorylation and oxidative phosphorylation.
-Include the organelle/organelle structures/locations involved in oxidative phosphorylation.

Demonstrate a clear evaluation of the cellular process by including answers to the following questions in your flowchart/discussion as **KEY-POINTS:**

**Note:** answers to these questions should be built into your flowchart/discussion and not simply listed.

1. In the presence of oxygen, the majority of ATPs are made by what process?
2. In the absence of oxygen, can the cell still make ATP, at least temporarily? How does it do that?
3. What must be supplied to glycolysis for the cell to continue making ATP in the absence of oxygen?
4. Why is cellular respiration important?
5. What activates the enzyme that functions to make ATP in the mitochondrial membrane?
6. Why does one NADH produce more ATP than one FADH2?
7. What is the final electron acceptor used in aerobic respiration?
8. What does ATP provide to the cell?
9. What are the two kinds of phosphorylation used during aerobic respiration?
10. What kind of gradient must be produced in order to activate chemiosmosis?

**Reminder: Check the rubric.** The rubric will help guide you in developing your flowchart and write-up.

You will need to hand in a physical copy of your work to your professor on the due date (DO NOT TRY TO SUBMIT YOUR ASSIGNMENT ONLINE). No late work will be accepted.