Investigation of Cell Organelles: Presentation and Model

Introduction

In this chapter we are looking at cells, the basic units of life. Even though cells are the basic units, they are still organized and made of smaller structures. Just as the body is made of organs, each having different shapes and functions, so the cells are made of organelles, which also have their own shape and function. We will be studying the following organelles:

1. mitochondria
2. endoplasmic reticulum
3. chloroplast
4. ribosome
5. golgi body
6. lysosome
7. vacuole
8. centrosome/centrioles
9. peroxisome
10. cytoskeleton
11. secretory vesicle

The cell can be compared to a factory. Like a factory, it makes products that need to be packaged and delivered to places inside or outside the cell. It needs energy to make its products, and blueprints to work from. Our goal in this project will be to understand how these organelles work together to help the cell do its work.
As discussed in class, we will be working in your lab groups. Each group has chosen an organelle. The project requirements are as follow.

Requirements

1. **Oral report:** your group will prepare a **seven to ten minute** oral report on your organelle. In your report, you should tell the class:
    - What is the structure of your organelle? (What does it look like?)
    - Where is it located in the cell?
    - What does it do for the cell (what are its ***functions***). You should be able to explain what your organelle does for the cell. For example, you might tell us that the mitochondrion is like the power plant, because ATP is synthesized there. Explaining what the organelle does and how its actions affect the rest of the cell will take up most of your time in the presentation.
    - When you give the report you should use either (1) the overhead (2) the white board or (3) the computer to show your audience an outline of what you will say. Alternatively, the computer could be used for a PowerPoint presentation. However, if you choose to use PowerPoint, your project will have be shown on the television screen because I do not have a projector. This outline should also be written on paper, so that it can be handed in when you give your report.

- Also, a bulleted sheet (like a study guide) that lists the most salient points about the structure and function of your organelle.
- Each member of the group should be involved in the presentation.
- Prior to the next exam, you must submit to Mr. Silluzio, three questions about your organelle. These questions will appear on the exam.

2. **A physical model:** your group will build a model that you will use during your presentation to show the class what your organelle looks like. The model should be constructed of materials that may be compared to both the structure and function of your organelle. For example, The mitochondria model might contain sugar (this would represent its function).
    - the model will be hung from the ceiling in the room after you make your presentations.
    - the model should be three-dimensional
    - be creative!
    - include with your model a piece of poster board or index card that has written on it the name of the organelle and a one or several-word description of the organelle.

Materials

The following books and other materials will be available for your research:

1. **Your textbook** has short descriptions of each organelle; there are also several other textbooks available for you to use.

2. **The Web:** start by looking at the "cell resources" on Mr. Silluzio's web site (http://www.mrsilluzio.com Explore these links to find:
    - descriptions of some of the organelles
    - diagrams
    - animaitons
    - electron micrographs (pictures taken with a microscope)

3. **Books** from the school library.

4. **Pictures.** In some of the books are electron micrographs, pictures taken with a powerful electron microscope. They might help you visualize what the organelle looks like. You can also find similar pictures on the web.

Some guidelines for proceeding:

- We will go to the computer room as a class to search for information that you might need. I recommend that you start by reading about your organelle in the textbook before searching for other sources.

- Once you have done some reading, brainstorm with your group members about how you might compare your organelle to a factory part, and how you might be able to explain to us what the organelle does. You will need to divide the labor - have each group member read more about one particular aspect of the organelle, or have one person work on the

model and another on the oral presentation.

- Before your first research day is done make some decisions about how to build your model, and which members of your group will work on it.

- At this point in the term, we have examined real cells with the microscope, comparing prokaryote to eukaryote cells, plant to animal cells and prokaryote cells to the organelles that exist within eukaryotes. We have also conduct several experiments to help us understand the structure and function of the cell membrane.

Assessment

Your grade for this assignment will be based on:

1. How well your presentation (including the model and outline) clearly presents the structure and function of your organelle.

2. A quiz (taken after the presentations), which will cover all of the organelles.

Your presentation will be graded with the following form (this is here for your information only - not to be filled out).

Biology Organelle Project -- grading sheet for presentations

Names of team members:		
Organelle:		
	Possible Points	**Points Given**
1. information presented -- clear, precise, covers everything that it should	40	
2. presentation itself -- understandable, everyone is involved	25	
3. model -- 3–D, displays all important info creative	25	
4. attention to task -- ability to work cooperatively with group members	10	