

Name \_\_\_\_\_

Date \_\_\_\_\_

# Invasion of the giant cell or Cytology-Just for the cell of it (AP)

adapted from “just for the cell of it” & Renee Roehrs

## **Introduction:**

Imagine for a moment that you have enlarged the nucleus of an atom to the size of a pin head: how far away would an electron in the first orbital be? The answer is 10 meters. To put this into perspective: imagine that you enlarge the pin head to the size of a baseball, the first electron would be the distance of the last seat in the baseball stadium.

One of the most difficult problems students have in studying cell structure and function is the size of the organelles within a cell. If we compare a cell to the size of our classroom, how big would all the organelles within it be? What objects would you use to model these organelles?

The goal of this project is to turn our classroom into a “giant cell” with organelles enlarged to scale. During this project you and your group will investigate the organelles of the cell and their functions within the cell. You will include this information in a written **report**. There will be one page for each organelle. In addition, as a group you will label cell diagrams. There should also be a **bibliography**, in correct scientific format, of all the sources used. In addition, you will create a three dimensional, scale model of each of the organelles and give on a **presentation** to explain their functions. The presentation will explain how each of the structures carries out one or more of the life processes and interacts with other organelles. The presentation should also tell if you are a plant cell or an animal cell. Remember to take into account the correct shape required for your type of cell. The presentation cannot be more than 3-5 minutes in length. It should appear well rehearsed and “polished”. As one group is doing their presentations, the audience will be taking notes from the presenters. **You must be able to answer questions from the audience or me!!!**

**You will be graded as a combination of your work (about 1/3) as well as group efforts (about 2/3).**

The giant cell will invade on\_\_\_\_\_.

## **Materials:**

Use your imagination. Creativity is encouraged, but whatever you choose, be sure that your organelles are to scale and realistic in shape.

use 5 microns(u) = 100 cm as your scale

## LIST OF ORGANELLES :

| ORGANELLE                           | SIZE ( TO SCALE IN CM) |
|-------------------------------------|------------------------|
| Nucleus                             |                        |
| nucleolus                           |                        |
| chromosomes                         |                        |
| cell membrane                       |                        |
| endoplasmic reticulum               |                        |
| ribosomes( some may be found on ER) |                        |
| mitochondria                        |                        |
| vacuole                             |                        |
| golgi body                          |                        |
| centriole                           |                        |
| chloroplast                         |                        |
| cell wall                           |                        |
| microtubules/microfilaments         |                        |
| peroxisomes                         |                        |
| plasmodesmata                       |                        |
| central vacuole and tonoplast       |                        |
| lysosome                            |                        |

### Methods:

#### PART 1 RESEARCH:

1. You will be put into groups. In the group you should decide upon the following roles (these people receive 5 pts bonus):

**NUCLEUS:** this is the group leader. This person will be in charge of organizing the group. This person needs to delegate tasks and be sure everyone knows what he/she should be working on. Give out daily assignments.

**CHROMOSOME:** this person will record information. In addition, they will create the final draft of the group's bibliography.

**LYSOSOME:** this is the policeman. His/her job is to keep everyone on task.

2. Decide if you want to do an animal or a plant cell as your presentation. Look up information to decide which organelles would be found in your cell type(plant or animal cell). **Everyone will have to build and research one or two organelles. Keep this in mind as you complete the next step.**

3. Next, decide who will do each organelle. You must do all of the organelles on the list which apply to your cell. The "chromosome" should record all the information about your roles on a grading sheet and submit it to me.

4. Use your text book and other resource materials to research your organelle(s). Calculate the correct scale to build your organelle and fill in the table. The size table must be included in your group report. Be able to answer the following questions:

- What is the function of your organelle within the cell? What life activity(activities) does it perform?
- How does your organelle interact with the other organelles in the cell in the normal functioning of the cell? Be sure to list all the organelles with which it interacts as well tell how.
- Is your organelle normally found in a plant cell or an animal cell ? Are there any differences in the organelle between the two cell types?
- What does this organelle look like? Include, size, shape and inside details.

**\*\*\* REMEMBER TO KEEP AN ACCURATE BIBLIOGRAPHY REFERENCE (in scientific format) FOR EVERY SOURCE YOU USED\*\*\***

5. **Individually**, label the cell diagram. **As a group**, compare answers. You should have one final copy to hand in.

#### PART II MODEL AND PRESENTATION:

1. **As a group**, brainstorm ideas about the three dimensional model that you will build. What materials should you use?? Calculate what size to build your organelle. Use the scale I gave you. Be sure that it will look as realistic as possible. Remember the overall cell shape too.  
**Individually**, build your organelle model.
2. Practice your presentation as a group. Remember , you are either a plant cell or an animal cell. I do not want to see any “it” cells. It should look well - prepared and professional. You may use note cards if you wish, but it will “cost” you points. On the day of the presentation, you should be ready to go as soon as you are called on. You will have no more than 5 minutes to perform. The “nucleus” should be organizing things during the practice. The “lysosome” will be sure everyone stays on task during these group times.

#### PART III REPORT:

1. **Individually**, write a report for your organelle. You should answer all of the questions you researched (see part 1 above). You should have a separate page(s) for each organelle. These should be neatly written or typed. Give a list of your sources( In correct scientific bibliography format) to the “chromosome” for your group.
2. **Final group report** : The report should be nicely presented. Someone (the “chromosome”) should create a cover page with the names of everyone in the group. Next, as a group, you should label the attached diagrams of cells and include 2. **Final group report**: The report should be nicely presented. Someone should make a cover with everyone’s name and role on it. The first page should be the labeled cell diagrams. Then, should come the organelle dimensions table, next the reports ( 1 page for each organelle). Finally, you will have your bibliography.