

The Virtual Cell Worksheet

Go to www.biologybynapiet.com Cell Unit and scroll down to the button for this lab. OR log on to <http://www.ibiblio.org/virtualcell/> then click on "The Virtual Cell Tour" Bus

1. **Centrioles** are only found in _____ cells. They function in cell _____. They have _____ groups of _____ arrangement of the protein fibers. Draw a picture of a centriole in the box.

2. **Lysosomes** are called _____ sacks. They are produced by the _____ body. They consist of a single membrane surrounding powerful _____ enzymes. Those lumpy brown structures are digestive _____. They help protect you by _____ the bacteria that your white blood cells engulf. _____ act as a clean up crew for the cell. Zoom in and draw what you see.

3. **Chloroplasts** are the site of _____. They consists of a _____ membrane. The stacks of disk like structures are called the _____. The membranes connecting them are the _____ membranes. Zoom in and draw a picture.

4. **Mitochondrion** is the _____ of the cell. It is the site of _____. It has a _____ membrane. The inner membrane is where most _____ respiration occurs. The inner membranes is _____ with a very large surface area. These ruffles are called _____. Mitochondria have their own _____ and manufacture some of their own _____. Draw a picture of the mitochondrion with its membrane cut.

5. **Endoplasmic Reticulum (ER)** is a series of double membranes that _____ back and forth between the cell membrane and the _____. These membranes fill the _____ but you cannot see them because they are very _____. The rough E.R. has _____ attached to it. This gives it its texture. These ribosomes manufacture _____ for the cell. The ribosomes are the _____ which manufacture proteins. Draw the rough ER with a ribosome.

6. **Smooth E.R.** _____ ribosomes. It acts as a _____ throughout the cytoplasm. It runs from the cell membrane to the nuclear _____ and throughout the rest of the cell. It also produces _____ for the cell. Draw a picture of the smooth ER.

7. **Cell Membrane** performs a number of critical functions for the _____. It regulates all that _____ and leaves the cell; in multicellular organisms it allows _____ recognition. Draw and shade the cell membrane.

Centriole

Lysosomes

Chloroplasts

Mitochondrion

Endoplasmic Reticulum (ER)

Smooth ER

Cell Membrane

8. **Nucleus** is called the _____ of the cell. It is a large _____ spot in eukaryotic cells. It _____ all cell activity. The nuclear membrane has many _____. The thick rosy strands are the _____. The large solid spot is the _____. The nucleolus is a spot of _____ chromatin. It manufactures _____. The chromatin is _____ in its active form. It is a _____ of DNA and histone proteins. It stores the information needed for the manufacture of _____. Draw a picture of the nucleus and its nucleolus.

**Nucleus &
Nucleolus**

9. **Golgi Body** is responsible for packaging _____ for the cell. Once the proteins are produced by the _____ E.R., they pass into the _____ like cisternae that are the main part of the Golgi body. These proteins are then squeezed off into the little _____ which drift off into the cytoplasm. Draw a picture of the Golgi Body as it is squeezing off the proteins.

Golgi Body

The "Virtual Cell" allowed you to get a close-up view of several organelles in 3-D! You were able to choose certain organelles within the cell and manipulate them by zooming in on the organelle, rotating the image, and dissecting several organelles to view their contents. The intent of this activity is to provide you with a better feeling of the appearance (structure), function, and location of the organelles.

You should have explored the following organelles within "The Virtual Cell": Please check off the ones you viewed.

1. _____ Mitochondria
2. _____ Centrioles
3. _____ Smooth Endoplasmic Reticulum (ER)
4. _____ Rough Endoplasmic Reticulum (ER)
5. _____ Lysosomes
6. _____ Golgi Body
7. _____ Nucleus (chromatin, nucleolus, ribosomes)
8. _____ Chloroplast
9. _____ Cell Membrane

Use your Organelle Table (and tour the virtual cell again if necessary) to answer the following questions.

1. Describe the structure of lysosomes.
2. What are the functions of lysosomes?
3. What is autolysis (done by lysosomes)?
4. Why is the inner membrane of mitochondria ruffled?
5. Describe the outer membrane of the nucleus.
6. What makes rough ER "rough"?