

The "Virtual Cell" will allow you to get a close-up view of several organelles in 3-D! You will be 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 the activity is to provide you with a better feeling of the appearance (structure), function, and location of the organelles.

You should explore the following organelles within "The Virtual Cell": Please check them off as you go.

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

*** The "Virtual Cell" will provide you with more information to add to your Organelle Table.

1. Click on the "Virtual Cell Tour" and answer the following questions:

1. Describe the process in which proteins are packaged by the golgi body.

2. Describe the structure of lysosomes.

3. What are the functions of lysosomes.

4. What is autolysis?

5. Describe the outer and inner structure of mitochondria.

6. Why is the inner membrane of mitochondria ruffled?

7. Where might have mitochondria originated from? Why?

8. Describe the arrangement of microtubules that compose the centrioles. (Hint: look carefully at the image)

9. Describe the outer membrane of the nucleus.

10. Describe the inner contents of the nucleus.

11. Describe the appearance of the nucleolus.

II. Once the tour is complete, Click on the "Text Book" to discover more information about the organelles that you are responsible for.

Work sheet provided by Mr. David Gauthier/ Mr. Ted Cotter Unit II Sophomore Biology

The Virtual Cell Worksheet

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.

Centriole

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.

Lysosomes

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.

Chloroplasts

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.

Mitochondrion

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.

Endoplasmic Reticulum (ER)

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.

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.

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 ropy strands are the _____. The large solid spot is the _____. The nucleolus is a spot of _____

Nucleolus

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.

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

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