

Inside The Cell

I. Cell Basics

A. All of the activities of life itself take place first on the cell level

B. Characteristics of Cells

1. Vary in size and Shape

C. Unicellular organisms – organisms made up just one cell

1. Example: Amoeba, algae, yeasts

D. Multicellular organisms – organisms made up of more than one cell

II. Levels of Organizations

A. Cells work together to make tissues

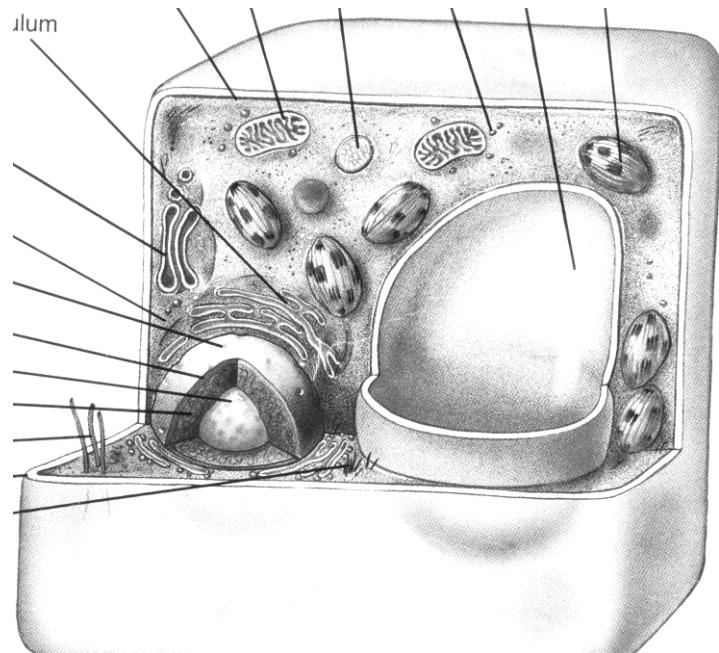
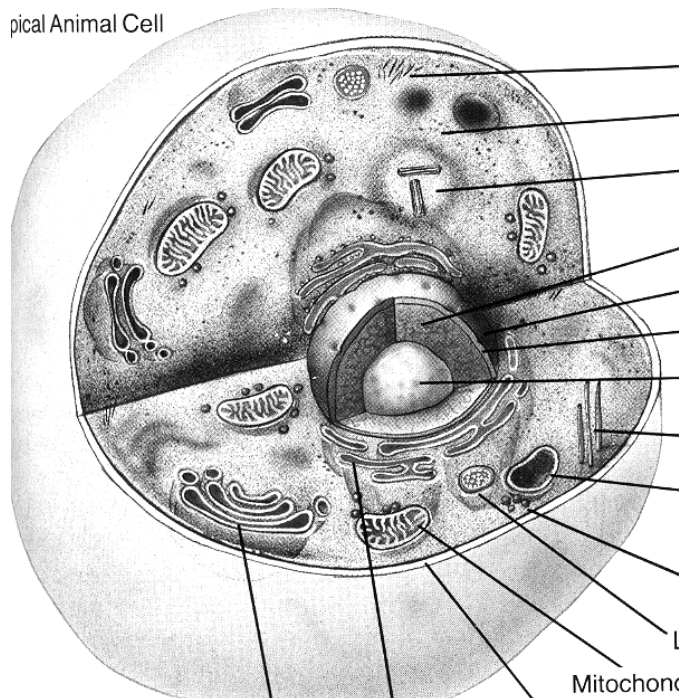
B. Tissues work together to make organs

C. Organs work together to form organ systems

D. Systems together form organisms

E. Organisms form communities

Typical Animal Cell



III. Cell Structure

A. Everything within the cell membrane is *protoplasm*

B. The material inside the nucleus is *nucleoplasm*

C. The material between the cell membrane and the nuclear membrane is cytoplasm

1. *Cytoplasm* is 70 % water

2. Its consistency is like gelatin desert

3. Most of the cells activities takes place in the cytoplasm

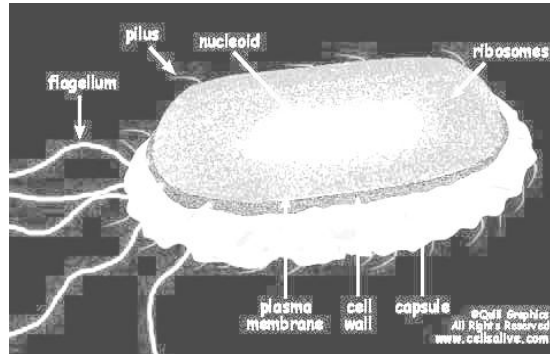
a. 100,000 proteins can be made each second

b. *Metabolism* is the sum of all chemical changes in the cell

D. Cell organization – inside a cell different parts do different things (called division of labor)

E. Cell Types

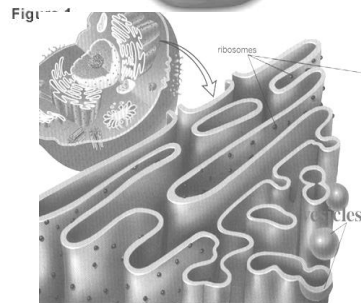
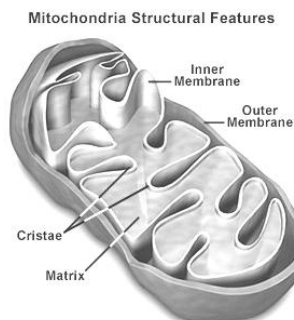
1. ***Eukaryotes*** are cells with nuclei
 - a. Example: Plants, animals, fungi, protists,
2. ***Prokaryote*** are cells without nuclei
 - a. Example: Monerans (Bacteria & Blue Green algae)



IV. Eukaryotic cell organelles

A. *Mitochondria* - most of the cellular respiration occurs here

1. Called the power house of the cell
2. Takes chemical energy and breaks it down into usable cell energy
3. The more energy a cell needs the more mitochondria it will have



B. *Endoplasmic reticulum* – is a network of fluid filled, tube like structures

1. Sometimes called the subway system in the cell
2. Mainly the transport of proteins

3. There is rough ER and smooth ER

4. Rough ER has ribosomes on it

C. *Ribosomes* – RNA proteins that are involved in the making of proteins (protein synthesis)

D. *Golgi Bodies* – are a series of flattened unconnected tubes (resembles smooth ER) and are involved in the storage and secretions of chemicals from the cell (read page 127)

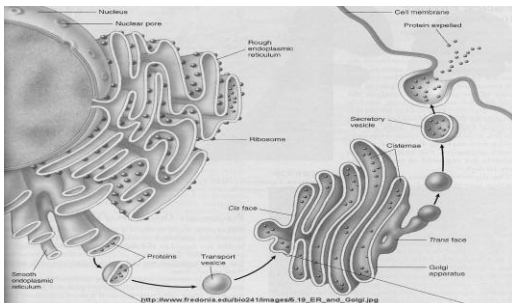
E. *Vacuoles* – clear fluid filled sacs used for food, water and mineral storage.

1. Vacuoles result from phagocytosis and pinocytosis
2. Contractile vacuoles are vacuoles that serve as pumps for removing excess water

F. *Lysosome* – small spherical organelles that contain digestive enzymes used for digestion of

large phagocytised particles and old cell parts

1. The lysosome membrane protects the cell from digesting itself



G. *Microfilaments* – long thread like structures involved in movement of the cell and cell parts

H. *Microtubules* – long thin structures that provide support and shape to the cell

1. Help with movement of genetic material when the cell divides during mitosis and meiosis

I. *Centrioles* – Sets of microtubules arranged in a circle and are important in cell division

J. *Flagella & cilia* – are similar structures because they are made of microtubules and are attached to an interior of a cell called Basal Body. Flagella are longer and usually only one or two per cell. There are many shorter cilia/ cell.

K. *Plastids* – found in green plants and green algae

1. ***Chloroplasts*** – are plastids that contain chlorophyll for photosynthesis

a. Traps light energy and turns it into chemical energy

L. The nucleus – spherical central body

1. ***Nuclear membrane*** – membrane around nucleus that has pores to allow selectively the movement of materials by way of the endoplasmic reticulum.

2. ***Nucleoli*** – the area of the nucleus that makes the RNA of ribosomes

3. ***Chromatin*** – is the chromosomes together in the nucleus

a. Made of chromosomes

1) DNA makes up chromosomes

M. Page 134 has a list of all of the cell structures and functions

