

## Chapter 3 Cells

### **Composite Cell:**

Function:

Basic Structure: A cell consists of three main parts: the \_\_\_\_\_, that houses the genetic material, the \_\_\_\_\_, that contains the organelles, and the outer \_\_\_\_\_.

### **Cell Membrane:**

The cell membrane is extremely \_\_\_\_\_ and is \_\_\_\_\_ permeable.

Function: The cell membrane regulates the movement of substances in and out of the cell, participates in signal transduction, and helps cells adhere to other cells.

Structure: The basic framework of the cell membrane consists of a double layer of \_\_\_\_\_, with fatty acid tails turned \_\_\_\_\_. Many types of \_\_\_\_\_ are found in the cell membrane, including some which are transmembrane and some that are peripheral membrane. What are some of the functions of these chemicals?

### **Cytoplasm:**

The cytoplasm consists of a clear liquid called \_\_\_\_\_, a framework or \_\_\_\_\_, and networks of membranes and organelles.

Endoplasmic reticulum: is made up of \_\_\_\_\_.

Rough ER: Why does it appear rough?

What does it function in the synthesis and transport of?

Smooth ER: Why does it appear smooth?

What does it function in the transport of?

Ribosome: Where are ribosomes found?

What are they composed of?

What do they help in the production of?

Golgi apparatus: is composed of flattened \_\_\_\_\_ and it packages the cell's products. Why would a cell want to do this? (Hint, why would any manufacturer want to package products?)

Mitochondria: are the \_\_\_\_\_ of the cell and contain \_\_\_\_\_ needed for aerobic respiration.

Lysosomes: contain \_\_\_\_\_ enzymes to break up old cell components and bacteria. They are sometimes called the "garbage disposals" of the cell.

<p><u>Peroxisomes</u>: contain _____ that function in the synthesis of bile acids, breakdown of lipids, degradation of rare biochemicals, and detoxification of alcohol.</p>
<p><u>Microfilaments and microtubules</u>: are threadlike structures that serve as the cytoskeleton of the cell. Microfilaments, made of the protein _____, cause various cellular movements. Microtubules, made of the globular protein _____. What kind of pattern do they make?</p>
<p><u>Centrosome</u>: is a structure made up of two hollow cylinders called _____. What is their function during mitosis?</p>
<p><u>Cilia and flagella</u>: are motile extensions from the cell.</p> <p>Which one is shorter?</p> <p>What is its function in the human body?</p> <p>What is the only flagellated cell in the body?</p>
<p><u>Vesicles</u>: (vacuoles): Form from part of the cell membrane or the _____ and _____ materials.</p>
<p><b>Nucleus:</b></p> <p>The nucleus is bounded by a _____ layered nuclear membrane containing relatively large nuclear _____ that allow the passage of certain substances.</p>
<p><u>Nucleolus</u>: Where is it found?</p> <p>Does it have its own membrane?</p> <p>What chemicals is it made of?</p>
<p><u>Chromatin</u>: What chemicals is the chromatin made of?</p>
<p><b>Movements Through Cell Membranes:</b></p> <p>The cell membrane controls what passes through it.</p> <p><u>Passive Transport</u>: Mechanisms of movement across the membrane may be passive, requiring no energy from the cell (diffusion, facilitated diffusion, osmosis, and filtration).</p> <p>Is a cell required for these mechanisms to occur?</p> <p><u>Diffusion</u>: from an area of _____ concentration to area of _____ concentration to reach _____.</p> <p>What are some examples of substances that diffuse in the human body?</p> <p><u>Osmosis</u>: The substance that moves by osmosis is _____.</p> <p>What pressure results from osmosis?</p>

**Facilitated Diffusion:** Facilitated diffusion uses membrane proteins called, \_\_\_\_\_, to move molecules (such as glucose) across the cell membrane.

**Tonicity:** A solution with the same osmotic pressure as body fluids is called \_\_\_\_\_; One with higher osmotic pressure than body fluids is \_\_\_\_\_; One with lower osmotic pressure is \_\_\_\_\_.

**Filtration:** Because of \_\_\_\_\_ pressure, molecules can be forced through membranes by the process of filtration. In the body, \_\_\_\_\_ pressure is a type of pressure causing filtration. Where does this occur?

**Active Transport:** Moves from area of \_\_\_\_\_ concentration to area of \_\_\_\_\_ concentration. This process requires \_\_\_\_\_ proteins: (pumps). Energy in the form of \_\_\_\_\_ is also required.  
Why would the body want to spend energy to acquire (or get rid of) something?

**Endocytosis and Exocytosis:** In \_\_\_\_\_ molecules that are too large to be transported by other means are engulfed by an invagination of the cell membrane and carried into the cell surrounded by a vesicle. The reverse is \_\_\_\_\_.  
\_\_\_\_\_ is a form in which cells engulf liquids.  
\_\_\_\_\_ is a form in which the cell takes in larger particles, such as a white blood cell engulfing a bacterium.

**Cell Cycle:**  
Series of changes a cell undergoes from when it is formed until it reproduces is called the cell cycle.  
The cell cycle consists of what four stages?  
The cell cycle is highly regulated. Most cells do not divide continually.  
Cells have a maximum number of times they can divide because of built-in “clocks” called \_\_\_\_\_ on the tips of chromosomes.

### **Cell Reproduction:**

There are two types of cell division, mitosis and meiosis. Meiosis produces sex cells.

**Mitosis:** How many daughter cells are produced in mitosis?  
Are they identical to the “mother” cell?

**Interphase:** Interphase is a period of great metabolic activity in which the cell grows and synthesizes new molecules and organelles. During the S phase of interphase, the \_\_\_\_\_ of the cell is replicated in preparation for cell division.

**Prophase:** What disappears during this phase?  
What appears or becomes visible during this phase?

Metaphase: Why is this phase the easiest to see on a microscope slide?  
(Hint, what are the chromosomes doing?)

Anaphase: What characterizes this phase?

Telophase: What reappears during this phase? What have the chromosomes done?

\_\_\_\_\_ begins during anaphase of mitosis and continues as the cell pinches into two new cells.

Differentiation: The process by which cells develop into different types of cells with specialized functions is called differentiation. What controls this?  
What is the death of a cell that is a normal part of development called?