

Name _____ Block _____ Date _____

Test 2 Study Guide: The Cell

Date of Test: October 31 (1st and 7th Block) or November 6 (6th block)

SOL: BIO. 3a-c;

Format: Multiple choice, short answer and fill-in-the-blank

Relevant Class Dates: October 4 – 30, 2017

- Cellsalive.com activity, Cell Structure Gizmo, Cell Types Gizmo, Microscope work
- Notes on cell theory, spontaneous generation, eukaryotes and prokaryotes, organelles, and cell specialization

Online Resources (Use these for additional information or review):

- www.bozemanscience.com/biology-main-page/ (All videos under “Unit 2: Chemistry of Life” and “Enzymes”)
- <https://www.youtube.com/user/AmoebaSisters> (Prokaryotes and Eukaryotes, the Grand Cell Tour, Endosymbiosis, Cell Specialization)

Cell Theory

- Describe the key events leading to the development of the cell theory.
 - The cell theory is the unifying theme in biology because it emphasizes the similarity of all living things. The traditional cell theory states that 1) living things are **composed of one or more cells** and that cells **come from other cells** by the process of cell reproduction; 2) **cells are the basic units** of structure and function of all living things; and 3) cells contain specialized structures to perform life functions.
 - The development of the cell theory was accelerated by the ability to make observations on a microscopic level. The development and refinement of **magnifying lenses and light microscopes** made the observation and description of living cells possible.
 - Continued advances in microscopy allowed observation of cell organelles and ultrastructure. Current technology (e.g. **electron microscopes**) allows the observation of cellular processes underlying both cell structure and function.
 - Important scientists who played roles in the development of the cell theory include:
 - **van Leeuwenhoek** (invented the precursor of the modern microscope)
 - **Hooke** (“discovered” the “cell” by looking at pieces of cork)
 - **Schwann** (determined all animals are made of cells)
 - **Schlieden** (determined all plants are made of cells)
 - **Virchow** (stated all cells come from preexisting cells)

Eukaryotes and Prokaryotes

- **Compare and contrast characteristics of prokaryotic and eukaryotic cells.**
 - Cell structure is one of the ways in which organisms differ from each other. The diversity that exists ranges from **simple prokaryotic** cells to **complex multicellular** organisms.
 - The simplest life forms exhibiting cellular structure are the prokaryotes. Earth's first cells were prokaryotes. Prokaryotic cells exist in two major forms: **eubacteria** and **archaeobacteria**. Prokaryotes are Earth's most abundant inhabitants. They can survive in a wide range of environments and obtain energy in a variety of ways.
 - **Eukaryotes** differ from prokaryotes based on size, **genetic material** surrounded by a **nuclear membrane**, and the addition of **membrane bound organelles** (i.e., mitochondria and chloroplasts).
 - Eukaryotes arose from prokaryotes and developed into larger, more complex organisms, from single-celled **protists** to multicellular **protists, fungi, plants, and animals**.
- **Identify the following essential cell structures and their functions.**
 - **the nucleus** (contains DNA; site where RNA is made)
 - **ribosome** (site of protein synthesis)
 - **mitochondrion** (site of cell respiration)
 - **chloroplast** (site of photosynthesis)
 - **endoplasmic reticulum** (transports materials through the cell)
 - **Golgi** (site where cell products are packaged for export)
 - **lysosome** (contains digestive enzymes)
 - **cell membrane** (controls what enters and leaves the cell)
 - **cell wall** (provides support)
 - **vacuole** (storage of material)
 - **cytoplasm** (contains organelles and site of many chemical reactions)
 - **cytoskeleton** (protein fibers that hold cell shape and structure in place)
- Cellular differences between plant and animal cells include the presence of a **cell wall** that gives the plant cell a defined shape, the presence **of chloroplast**, and the **number of vacuoles**