

Chapter 4 – *A Tour of the Cell* AND Chapter 5 – *The Working Cell*

EXAM REVIEW

Review the nucleus and the various structures that make up the endomembrane system by matching each phrase on the right with a structure from the list on the left. Answers can be used more than once. {Web/CD Activity 4E, 4F, and 4I}

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|---------------------------------|-------|-----------------------------------------------------------------------|
| A. Nucleus | _____ | 1. lipids manufactured here |
| B. Transport vesicle | _____ | 2. small structure that makes protein |
| C. Central vacuole | _____ | 3. contains chromatin |
| D. Smooth endoplasmic reticulum | _____ | 4. sac of enzymes that digests things |
| E. Lysosome | _____ | 5. carries secretions for export from cell |
| F. Golgi apparatus | _____ | 6. breaks down drugs and toxins in liver |
| G. Rough endoplasmic reticulum | _____ | 7. makes cell membranes |
| H. Contractile vacuole | _____ | 8. cell control center |
| I. Ribosome | _____ | 9. numerous ribosomes give it its name |
| J. Tight Junction | _____ | 10. "ships" products to plasma membrane, outside, or other organelles |
| K. Plasmodesma | _____ | 11. may store water, needed chemicals, wastes, pigments in plant cell |
| L. Anchoring Junction | _____ | 12. buds off from Golgi apparatus |
| M. Cell Wall | _____ | 13. defective in Pompe's disease and Tay-Sachs disease |
| N. Communicating Junction | _____ | 14. proteins made here for secretion from cell |
| O. Extracellular matrix | _____ | 15. pumps out excess water from some cells |
| | _____ | 16. nonmembranous organelle |
| | _____ | 17. takes in transport vesicles from ER and modifies their contents |
| | _____ | 18. digests food, wastes, foreign substances |
| | _____ | 19. surrounded by double layer of membranes with pores |
| | _____ | 20. channel between animal cells |
| | _____ | 21. rigid cellulose covering of plant cell |
| | _____ | 22. link animal cells in leakproof sheet |
| | _____ | 23. channel between plant cells |
| | _____ | 24. connects animal cells, leaving space between them |
| | _____ | 25. sticky layer holds animal cells together |

Compare the components of the cytoskeleton by indicating with a (+) for present or a (-) for absent which of the following are characteristics of microfilaments, intermediate filaments, or microtubules. {Web/CD Activity 4H}

<i>Characteristic</i>	<i>Microfilaments</i>	<i>Intermediate Filaments</i>	<i>Microtubules</i>
hollow tubes	-	-	+
solid rods			
ropelike structure			
made of tubulin			
made of actin			
made of fibrous proteins			
help cell change shape			
reinforcing rods, anchor organelles			
act in muscle cell contraction			
move chromosomes			
act as tracks for organelle movement			
give cell rigidity, shape			
in cilia			
in flagella			
in centrioles			
9+2 pattern			

Briefly summarize the differences between the words or phrases in each of the following pairs. {Web/CD Activity 5A, 5B, and 5C}

1. kinetic energy and potential energy – ***Kinetic energy is energy that is doing work and potential energy is stored energy.***
2. exergonic reactions and endergonic reactions
3. reactants and products

4. ATP and ADP
5. A reaction without an enzyme and a reaction with an enzyme
6. photosynthesis and cellular respiration
7. First and Second Law of Thermodynamics

Review diffusion and the function of the cell membranes by matching each of the phrases on the right with the appropriate mechanisms from the list on the left. At least two of the questions will require more than one answer. {Web/CD Activity 5H, 5I, 5J, 5K, and 5L}

- | | | |
|-----------------------------------------|-------|----------------------------------------------------------------------------------------------------|
| A. Diffusion | _____ | 1. diffusion across a biological membrane |
| B. Active transport | _____ | 2. moves solutes against concentration gradient |
| C. Osmosis | _____ | 3. any spread of molecules from area of higher concentration to area of lower concentration |
| D. Phagocytosis | _____ | 4. diffusion with help of transport protein |
| E. Passive transport | _____ | 5. three types of endocytosis |
| F. Facilitated diffusion | _____ | 6. engulfing of fluid in membrane vesicles |
| G. Pinocytosis | _____ | 7. diffusion of water across selectively permeable membrane, from hypotonic to hypertonic solution |
| H. Receptor mediated endocytosis | _____ | 8. transport molecules need ATP to function |
| I. Exocytosis | _____ | 9. enables cell to engulf bulk quantities of specific large molecules |
| | _____ | 10. how oxygen and carbon dioxide enter and leave cells |
| | _____ | 11. two types of passive transport |
| | _____ | 12. engulfing of particle in membrane vesicle |
| | _____ | 13. fusion of membrane-bound vesicle with membrane, and dumping of contents outside cell |
| | _____ | 14. how a cell might capture a bacterium |
| | _____ | 15. cellular "drinking" |

Osmosis is an important process that has many effects on living things. Test your understanding of osmosis by predicting in each of the following cases whether water will enter the cell (IN) or leave the cell (OUT), or whether there will be no net movement of water (None). Assume that the plasma membrane is permeable to water but not to solutes. {Web/CD Activity 5I}

OUT

1. Cell is exposed to hypertonic solution.

2. Cell is placed in salt solution whose concentration is greater than cell contents.

3. Due to disease, solute concentration of body fluid outside cell is less than solute concentration of cells.

4. Cell is in isotonic solution.

5. Single-celled organism is placed in drop of pure water for examination under microscope.

6. Cell is immersed in solution of sucrose and glucose whose individual concentrations are less than concentration of solutes in cytoplasm, but whose combined concentration is greater than concentration of solutes in cytoplasm.

7. Solute concentration of cell is greater than solute concentration of surrounding fluid.

8. Cell is exposed to hypotonic solution.

9. Concentration of solutes in cytoplasm is equal to solute concentration of extracellular fluid.

10. Cytoplasm more dilute than surrounding solution.