

### Cell Take-Home Test

- Which of the following is/are **not** found in a prokaryotic cell?  
A. ribosomes      B. plasma membrane      ☒ C. mitochondria      D. A and C
- Eukaryotic cells can be larger than prokaryotic cells because  
☒ A. their plasma membrane is more expandable.  
☒ B. their internal membrane system allows compartmentalization of functions and extra surface area for nutrient exchange and placement of enzymes.  
C. their DNA is localized in the nucleus whereas protein synthesis occurs in the cytoplasm.  
D. they have a better surface-area-to-volume ratio.
- Which of the following is **not** a similarity among the nucleus, chloroplasts, and mitochondria?  
A. They all contain DNA.  
B. They all are bounded by a double phospholipid bilayer membrane.  
C. They can all divide to reproduce themselves.  
☒ D. They all are derived from the endoplasmic reticulum system.
- The pores in the nuclear envelope provide for the movement of  
A. proteins into the nucleus.  
B. ribosome subunits out of the nucleus.  
C. mRNA out of the nucleus.  
☒ D. all of the above.
- The nucleolus functions in which 2 of the following? (there are 2 answers; fill in both answers)  
☒ A. synthesis of ribosomes.  
B. formation of spindle fibers.  
C. condensation of chromosomes.  
D. direction of DNA synthesis.  
☒ E. production of RNA
- The largest number of bound ribosomes most likely would be found in a cell  
A. with a high metabolic rate.  
☒ B. that produces secretory products.  
C. with many cilia.  
D. that is actively dividing.
- Which structure is **not** considered to be part of the endomembrane system?  
A. Golgi      B. smooth ER      C. nuclear envelope      D. lysosome      ☒ E. mitochondria
- A plant cell grows larger primarily by  
A. increasing the number of vacuoles.      ☒ C. taking up water into its central vacuole.  
B. synthesizing more cytoplasm.      D. synthesizing more cellulose.
- The innermost portion of a mature plant cell wall is the  
A. primary cell wall.      C. middle lamella.  
☒ B. secondary cell wall.      D. glycocalyx.  
E. tonoplast

10. The contractile elements of muscle cells are  
 A. intermediate filaments. B. centrioles. C. microtubules. ☒ D. microfilaments.
11. Microtubules are components of all of the following **except**  
 A. centrioles.  
 B. the spindle apparatus for separating chromosomes in cell division.  
☒ C. the pinching apart of the cytoplasm in animal cell division.  
 D. flagella and cilia.
12. Of the following, which is probably the most **common** route for membrane flow in the endomembrane system?  
 A. rough ER – Golgi – lysosomes – vesicles – plasma membrane  
☒ B. rough ER – smooth ER – Golgi – vesicles – plasma membrane  
 C. nuclear envelope – rough ER – Golgi – smooth ER – lysosomes  
 D. rough ER – vesicles – Golgi – smooth ER – plasma membrane
13. Proteins to be used within the cytosol are generally synthesized  
 A. by ribosomes bound to rough ER. C. by the nucleolus.  
☒ B. by free ribosomes. D. within the Golgi apparatus.
14. Many of the proteins made by rough ER become part of  
 A. the ribosomes. B. the cytosol. ☒ C. membranes. D. the cytoskeleton.
15. Plasmodesmata in plant cells are similar in function to  
 A. desmosomes. B. tight junctions. ☒ C. gap junctions. D. the glycocalyx.
16. Dynein is involved in  
☒ A. the movement of microtubules. C. the attachment of the microtrabecular lattice.  
 B. the contraction of microfilaments. D. the tensile strength of intermediate filaments.
17. Which of the following is **true** about a chloroplast? (2 answers are correct; mark both letters)  
☒ A. the grana is in the thylakoid ☒ C. the chlorophyll is in the thylakoid  
☒ B. the thylakoid is in the stroma D. the grana is in the chlorophyll
18. What do both mitochondria and chloroplasts have in common?  
 1. They are surrounded by a double membrane.  
 2. DNA is present.  
 3. Ribosomes are present.  
 A. 1 only B. 2 only C. 3 only D. Only 1 and 2 are correct. ☒ E. 1, 2 and 3 are all correct
19. A cellular diameter of 40 micrometers is equivalent to  
 A. 0.4 millimeter.  
 B. 0.04 millimeter.  
 C. 40,000 nanometers.  
 D. 4,000 nanometers.  
☒ E. Both 0.04 millimeter and 40,000 nanometers are correct.
20. Organelles that contain DNA include  
 A. ribosomes. C. chloroplasts.  
 B. mitochondria. ☒ D. mitochondria and chloroplasts only.  
 E. ribosomes, mitochondria, and chloroplasts.
21. Which of the following would be found in an animal cell, but **not** in a bacterial cell?  
 A. DNA B. cell wall C. plasma membrane D. ribosomes ☒ E. cytoskeleton

22. What are the membrane structures that function as transport facilitators?  
 A. peripheral proteins  
 B. carbohydrates  
 C. cholesterol  
 D. hydrophobic molecules  
☒ E. integral proteins
23. A cell has the following molecules and structures: enzymes, DNA, ribosomes, plasma membrane, and mitochondria. It could be a cell from  
 A. a bacterium.  
 B. an animal, but not a plant.  
 C. a plant, but not an animal.  
☒ D. a plant or an animal.
24. Cells can be described as having a "cytoskeleton" of internal structures that contribute to the shape, organization, and movement of the cell. All of the following are part of the "cytoskeleton" except  
☒ A. cell wall.      B. microtubules.      C. microfilaments.      D. intermediate filaments.

*Refer to the following 5 headings to answer the next several questions. Choose the most appropriate heading for each phrase. One heading may be used once, more than once, or not at all.*

- A. lysosome
- B. RER
- C. mitochondrion
- D. Golgi
- E. SER

25. Contains many enzymes (fill in all possible answers) **A B C D E**
26. Helps to recycle the cell's organic material **A**
27. Site of oxygen utilization in ATP synthesis **C**
28. Involved in storage diseases such as Tay-Sach's **A**
29. Involved in producing phospholipids **E**
30. Detoxifies alcohol in the liver **E**
31. Contains cristae **C**
32. Makes steroid hormones **E**
33. Digests worn out organelles **A**
34. Sorts out mixtures of substances and sends them to their proper destinations. **D**
35. protein synthesis is closely associated with this structure **B**
36. Ions can travel directly from the cytoplasm of one animal cell to the cytoplasm of an adjacent cell through  
 A. plasmodesmata.  
 B. intermediate filaments.  
 C. tight junctions.  
 D. desmosomes.  
☒ E. gap junctions.



37. Microfilaments participate in the formation of  
☐ A. cilia. ☐ C. flagella.  
☒ B. cell cleavage furrows. ☐ D. mitotic spindles.  
☐ E. basal bodies.
38. An animal secretory cell and a leaf cell are similar in all but one of the following ways **EXCEPT**:  
☐ A. They both have Golgi apparatus.  
☐ B. They both have mitochondria.  
☐ C. They both have transport proteins for active transport of ions.  
☒ D. They both have chloroplasts.  
☐ E. They both have a cell membrane.
39. Cells would be unable to form cilia or flagella if they did not have which cell structures?  
☒ A. ribosomes ☐ B. chloroplasts ☐ C. centrioles ☐ D. plastids ☐ E. microfilaments
40. Which of the following is a storage organelle for starch?  
☐ A. chloroplasts ☐ B. chromoplasts ☒ C. leucoplasts ☐ D. peroxisomes ☐ E. Golgi bodies
41. Which of the following contains the 9+2 arrangement of microtubules?  
☒ A. cilia ☐ B. centrioles ☐ C. basal bodies ☐ D. microfilaments
42. A biologist ground up some plant cells and then centrifuged the mixture. She obtained some organelles from the sediment in the test tube. The organelles took up CO<sub>2</sub> and gave off O<sub>2</sub>. The organelles are most likely  
☒ A. chloroplasts. ☐ B. ribosomes. ☐ C. nuclei. ☐ D. mitochondria. ☐ E. Golgi apparatus.
43. Which of the following cell components is **not** directly involved in synthesis or secretion?  
☐ A. ribosomes ☐ C. Golgi bodies  
☐ B. rough endoplasmic reticulum ☐ D. smooth endoplasmic reticulum  
☒ E. lysosome
44. All of the structures listed below are associated with movement in cells **EXCEPT**  
☐ A. cilia. ☐ B. centrioles. ☐ C. microtubules. ☐ D. flagella. ☒ E. peroxisomes.
45. According to the fluid-mosaic model of cell membranes, which of the following is a **true** statement about membrane phospholipids?  
☒ A. They move laterally along the plane of the membrane.  
☐ B. They frequently flip-flop from one side of the membrane to the other.  
☐ C. They occur in an uninterrupted bilayer, with membrane proteins restricted to the surface of the membrane.  
☐ D. They are free to depart from the membrane and dissolve in the surrounding solution.  
☐ E. They have hydrophilic tails in the interior of the membrane.
46. Which of the following are functions of membrane proteins (fill in all possible answers)  
☒ A. catalyzing reactions. ☒ C. hormone reception.  
☒ B. transport of materials. ☒ D. cell adhesion.  
☒ E. cytoskeleton attachment.
47. What membrane-surface molecules help cells recognize each other? (fill in TWO possible answers)  
☐ A. phospholipids ☒ B. proteins ☐ C. cholesterol ☒ D. carbohydrate chains

## Cell Take-Home Key

*FILL IN THE BLANKS with the appropriate cellular organelle or structure.*

- 48. transport membranes and products to various locations vesicles
- 49. infolding of mitochondrial membrane with attached enzymes cristae
- 50. carbohydrate coat on animal cells glycocalyx
- 51. small sacs with specific enzymes that pinch off Golgi lysosomes / vesicles
- 52. system of flattened sacs inside chloroplasts thylacoids / grana
- 53. anchoring structure for cilia and flagella Basal Body
- 54. semifluid medium between nucleus and plasma membrane cytoplasm
- 55. system of fibers that maintains cell shape, supports organelles cytoskeleton
- 56. connection between animal cells that creates impermeable layer tight junctions
- 57. membrane surrounding central vacuole of plant cells tonoplast

**MATCHING:** Match the function and structure with the proper organelle or cellular component. Choose your answers from the list below the chart, and fill in the letters in the chart.

	Function	Structure	Organelle
58	E	b	Chloroplast
59	K	j	Golgi apparatus
60	I	d	Lysosome
61	D	i	Mitochondrion
62	A	e	Nucleolus
63	C	g	Nucleus
64	B	c	Ribosome
65	J	a	Rough ER
66	H	k	Smooth ER
67	G	f	Cytoskeleton
68	F	h	Large, Central Vacuole

#### FUNCTION:

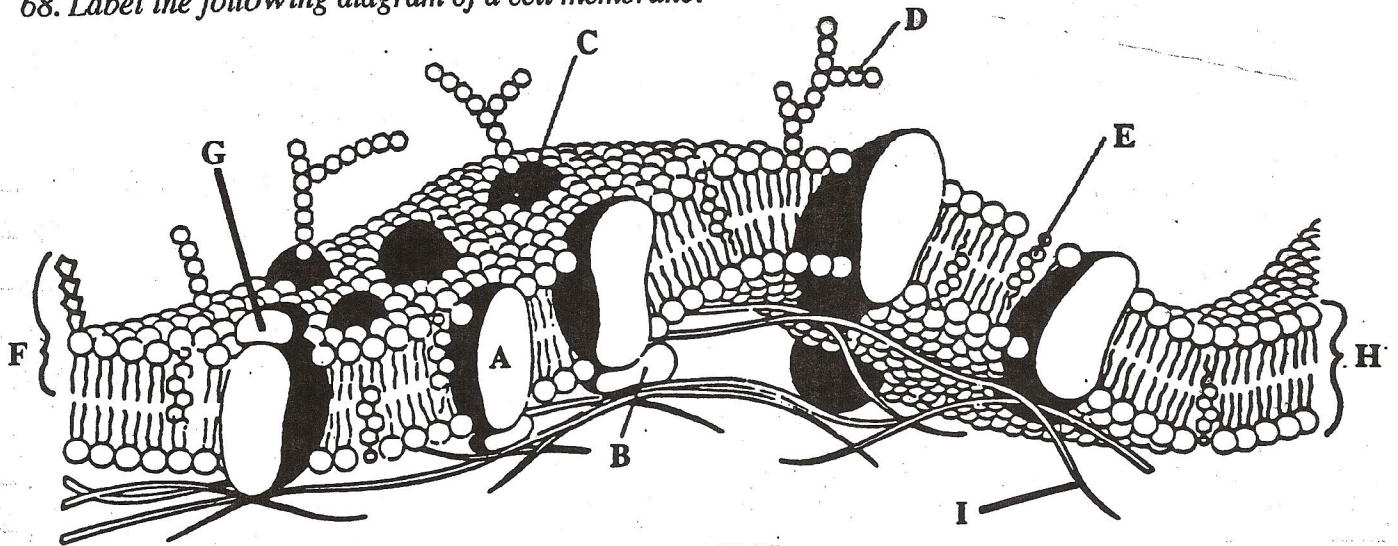
- A. produces RNA and ribosome subunits
- B. manufactures proteins
- C. contains chromosomes, produces mRNA
- D. site of cellular respiration
- E. site of photosynthesis
- F. storage, cell elongation, found in center of plant cells
- G. maintains cell shape
- H. houses enzymes that synthesize steroids, detoxify drugs, store and release calcium ions
- I. digests macromolecules
- J. manufactures membranes and secretory products
- K. processes products of rough ER

#### STRUCTURES:

- a. network of membranes with attached ribosomes
- b. double membrane sac containing stacks of membrane sacs
- c. large and small subunits, attach to mRNA
- d. sac with hydrolytic enzymes, acid pH
- e. round structure with multiple copies of genes for ribosomal RNA
- f. made of tubulin and actin
- g. surrounded by double membrane, with pores
- h. large compartment formed from small vesicles
- i. double membrane sac with cristae
- j. stack of flattened sacs, cis, trans faces
- k. membrane network without attached ribosomes



68. Label the following diagram of a cell membrane:



- A. Integral or transmembrane protein
- B. peripheral protein
- C. glycoprotein / transmembrane protein
- D. glucolipid - carbohydrate gp or oligosaccharide chain / glycocalyx
- E. cholesterol
- F. glucolipid
- G. peripheral protein
- H. phospholipid bilayer
- I. cytoskeleton / microtubule or microfilament