**Study Guide**

**Cells**

**Lecture learning goals**

* What is a cell and what are the two general types of cells?
* Differentiate into which of the 3 domains organisms belong.
* Discuss how endosymbiosis theory connects prokaryotes and eukaryotes and which organelles are believed to have arisen from this theory.
* Describe nine important components in eukaryotic cells.
* Diagram the pathway of a protein or lipid to its final destination.
* Distinguish between plant and animal cells.

**Guiding questions**

1. What two facts form the foundations of the cell theory?

2. Distinguish prokaryote cells from eukaryote cells including the characteristics/structures of each.

3. Give examples of prokaryotic and eukaryotic cells and distinguish in which domain each belongs.

4. Are prokaryotes structurally simpler than eukaryotes? Are they physiologically/functionally simpler? How does the size of prokaryotes compare to that of eukaryotes?

5. What is the advantage of compartmentalization in eukaryotic cells.

6. Know the basic structure and function of the following structures and organelles:

 nucleus

 endoplasmic reticulum - RER versus SER

 ribosome

 golgi complex

 lysosomes

 mitochondria

 chloroplasts

 central vacuole

 cell wall

 cytoskeleton

 flagella versus cilia

 nucleolus

7. What are the three chief purposes of the cytoskeleton?

8. Why do human fat cells possess very few mitochondria, while human muscle cells can possess as many as 2,000 mitochondria?

9. What are the five key functions of plant vacuoles?

10. What is the main function of chloroplasts?

11. What is endosymbiosis? What is the significance of some organelles having double membranes and their own DNA?

12. Trace the production of a protein from its blueprint form in the nucleus to its release from the cell.

**Blasts from the past (i.e. old test questions)**

Which one of the following is NOT found in prokaryotic cells?

A. DNA

B. ribosomes

C. a cell wall

D. nucleus

Remember the phylogenic tree of all living things. Which type of living things developed most recently on Earth?

A. Eukarya

B. Archaea

C. Bacteria

\_\_\_\_\_\_ is to mitochondria and chloroplasts as \_\_\_\_\_ is to other organelles.

A. cell theory; invagination theory

B. invagination theory; endosymbiosis theory

C. invagination theory; cell theory

D. endosymbiosis theory; cell theory

E. endosymbiosis theory; invagination theory

Which of the following organelles is NOT found in both plant and animal cells?

A. Mitochondria

B. Lysosomes

C. Central vacuole

D. Smooth ER

E. Golgi

Given that a cell's structure reflects its function, what would you predict that the function of a cell with a large Golgi would be?

A. attachment to bone tissue

B. movement

C. transport of chemical signals

D. rapid replication of genetic material

E. coordination of cell division