Module 4: Cells — Study Questions

1. What are the three main principles of cell theory?
2. Why is the cell considered the basic unit of life?
3. Who were some of the scientists that contributed to the development of cell theory?
4. What is the main structural difference between prokaryotic and eukaryotic cells?
5. Give two examples of organisms with prokaryotic cells and two examples with eukaryotic cells.
6. What structures do both prokaryotic and eukaryotic cells have in common?
7. Describe the structure of the plasma membrane. Why is it called the "fluid mosaic model"?
8. What is the function of the nucleus, and why is it called the "control center" of the cell?
9. Explain the difference between rough endoplasmic reticulum and smooth endoplasmic reticulum.
10. Describe the function of the Golgi apparatus in protein processing and transport.
11. What is the primary function of mitochondria? Why are they called the "powerhouses" of the cell?
12. What would happen to a cell if its lysosomes stopped functioning properly?
13. Trace the path of a secretory protein from synthesis to export out of the cell.
14. If a cell were a factory, what role would each of these organelles play: nucleus, ribosome, ER, Golgi, mitochondria?
15. What three structures are found in plant cells but NOT in typical animal cells?
16. Why do plant cells have both mitochondria and chloroplasts?

17. Explain the endosymbiotic theory. What evidence supports this theory?

18. Describe the components of the cytoskeleton and their functions.

19. Why must cells remain small? Explain the relationship between surface area and volume.

20. How do cilia and flagella differ in structure and function?