CHAPTER 4 A Tour of the Cell

OBJECTIVES

Introduction to the World of the Cell

Introduction
Explain why art is so important to an understanding of biology.
4.1 Compare the designs and images produced by a light microscope, scanning electron microscope, and transmission electron microscope. In addition, distinguish between magnification and resolving power.
4.1 Define cell theory and briefly describe the discoveries that led to its development.
4.2 Explain why cell size and shape varies.
4.2 Explain the relationships between nanometers, micrometers, millimeters, centimeters, and meters.
4.3 Explain why there are both upper and lower limits to cell size.
4.4 Distinguish between prokaryotic and eukaryotic cells.
4.5 Explain why compartmentalization is important in eukaryotic cells.
4.5 Compare the structures of plant and animal cells. Note the function of each cell part.

Organelles of the Endomembrane System
4.6-4.11, 4.13-4.14 Describe the structure and functions of the nucleus, endomembrane system, rough and smooth endoplasmic reticulum, Golgi apparatus, and lysosomes.
4.12 Explain how impaired lysosomal function can cause the symptoms of storage diseases.

Energy-Converting Organelles
4.15-4.16 Compare the structure and functions of mitochondria and chloroplasts.

The Cytoskeleton and Related Structures
4.17 Compare the structures and functions of microfilaments, intermediate filaments, and microtubules.
4.18 Explain how the structure of cilia and flagella relate to their functions.

Eukaryotic Cell Surfaces and Junctions
4.19 Compare the structures and functions of cell surfaces and intercellular junctions of plant and animal cells.

Functional Categories of Organelles
4.20 Describe the four functional categories of eukaryotic organelles, noting which organelles are in each group.
4.21 Describe the properties we would expect to find in extraterrestrial life.