

Guided Reading Questions

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Chapter 4 A Tour of the Cell

- (intro) What did Anton van Leeuwenhoek and Robert Hooke see under the microscope? From what is the word “cell” derived? What is an organelle? Define micrograph.
- (4.1) How does a light microscope work? Define magnification and resolving power. What does cell theory state? How does an electron microscope differ from a light microscope? Contrast a scanning electron microscope from a transmission electron microscope.
- (4.2) What is the size of the smallest, largest and longest cells? What factor determines the smallest size possible for a cell? What factor determines the maximum size?
- (4.3) What are the two types of cells? What do all cells have in common? What is the function of the ribosomes? What distinguishes the two types of cells? How large are prokaryotic cells? Where is the DNA in prokaryotic cells? What are the functions of the cell wall, capsule, pili and flagella?
- (4.4) What is the cytoplasm? What encloses most of the organelles in eukaryotic cells? What are the benefits of the internal structures? Which of these structures are present only in animals – lysosomes, centrioles, flagella, cell wall, chloroplast, central vacuole? Which are found only in plants?
- (4.5) What is the function of the nucleus? What is the strand of DNA and protein called? What is the nuclear envelope? What is the nucleolus made of? What is the function of the nucleolus?
- (4.6) What is the endomembrane system? What are the two types of endoplasmic reticulum? Which type of endoplasmic reticulum is continuous with the nuclear envelope? What is the function of the endomembrane system?
- (4.7) How does the smooth endoplasmic reticulum (SER) differ from the rough endoplasmic reticulum (RER)? What are three functions of the SER? What happens in the SER in liver cells when poisons are detoxified?
- (4.8) What causes the roughness in the rough endoplasmic reticulum (RER)? What are the two functions of the RER? Define secretory protein, glycoprotein and transport vesicle.
- (4.9) What does the Golgi apparatus look like? What are the functions of the Golgi apparatus?
- (4.10) From what organelles are lysosomes derived? What do lysosomes carry? How are lysosomes used within a cell?
- (4.11) Define a lysosomal storage disease. What is a hydrolytic enzyme (try to recall hydrolysis from section 3.3)? What cells do Pompe’s disease and Tay-Sachs disease affect?
- (4.12) What is a vacuole? What is the function of the central vacuole in plants? What type of vacuole is found in *Paramecium*? What is the function of the contractile vacuole?
- (4.13) How do products made in the endoplasmic reticulum leave the cell without crossing the plasma membrane? How are chloroplasts and mitochondria different from other organelles?
- (4.14) What is photosynthesis? What is the function of chloroplasts? Define stroma and granum. How many membranes does a chloroplast have?
- (4.15) What is the function of mitochondria? How many membranes does a mitochondrion have? Define intermembrane space, mitochondrial matrix, and cristae. What is the purpose of the

cristae?

- (4.16) What is the cytoskeleton? What are two functions of the cytoskeleton? What are the three types of fibers in the cytoskeleton? What proteins are microfilaments and microtubules made of? What are other functions of microtubules?
- (4.17) Contrast cilia and flagella. What is the function of cilia and flagella? What fiber makes the core of cilia and flagella? How are these fibers arranged? What structure is at the base of the flagellum? How do the dynein arms move the flagellum
- (4.18)? What is the function of plant cell walls? What are plant cell walls made of? What are plasmodesmata and cell junctions. Do animals have cell walls? What is the extracellular matrix of animals made of and what is its function? Contrast tight junctions, anchoring junctions and communicating junctions.
- (4.19) What are the four main categories that the text classifies the eukaryotic organelles? Which of the categories contains membranes? What is the common theme in the fourth category? What characteristics do all life forms from earth share?