

Plants and Society, 8e (Levetin)
Chapter 2 The Plant Cell

- 1) The biological term, "*cell*" came about through the study of _____ cells.
- A) tomato
 - B) wood
 - C) bone
 - D) cork
 - E) blood
- 2) Which of the following is *not* a statement of the *Cell Theory*?
- A) All cells arise from preexisting cells.
 - B) All cells contain the hereditary material, DNA.
 - C) All organisms are made up of cells.
 - D) The cell is the basic unit of life.
 - E) All of the above are correct statements about the *Cell Theory*.
- 3) Who among the scientists listed below was *not* directly involved in the development of the *Cell Theory*?
- A) Hooke
 - B) Schleiden
 - C) Schwann
 - D) Virchow
 - E) All of these men were involved in the development of the Cell Theory.
- 4) The *Cell Theory* is categorized as which of the following?
- A) an educated guess
 - B) a hypothesis that is in need of testing
 - C) a speculative idea
 - D) untested but quite probable
 - E) an explanation accepted as a major principle of biology
- 5) The primary cell wall of a plant _____.
- A) consists of cellulose and lignin
 - B) forms inside of the secondary cell wall
 - C) consists primarily of cellulose
 - D) gives wood its characteristic flexibility
 - E) is described by more than one of these characteristics
- 6) Which of the following is found *only* in a plant cell?
- A) Nucleus
 - B) Mitochondria
 - C) Endoplasmic reticulum
 - D) Chloroplasts
 - E) Ribosomes

- 7) Which of the following statements about lignin is *not* correct?
- A) Lignin is indigestible by all organisms.
 - B) In trees, lignin is more abundant in softwood species than hardwood species.
 - C) Lignin protects the plant from pathogens.
 - D) Lignin is found in secondary cell walls.
 - E) Lignin is not found in primary cell walls.
- 8) Movement of materials from one plant cell to another is accomplished through which of the following?
- A) the cytosol
 - B) the middle lamella
 - C) microtubules
 - D) plasmodesmata
 - E) the cytoskeleton
- 9) Which of the following serves as the "cement" that glues plant cells together?
- A) cytosol
 - B) lignin
 - C) cellulose
 - D) the cytoskeleton
 - E) pectin
- 10) If you could travel from the *inside of one plant cell into an adjacent plant cell*, in what order would you find the following plant cell structures listed below?
- A) cytoplasm, plasma membrane, cell wall, middle lamella
 - B) plasma membrane, cytoplasm, middle lamella, cell wall
 - C) cytoplasm, plasma membrane, middle lamella, cell wall
 - D) cytoplasm, middle lamella, plasma membrane, cell wall
 - E) None of the above are correct.
- 11) Microtubules and microfilaments comprise the structure of which of the following?
- A) cell wall
 - B) plasmodesmata
 - C) plasma membrane
 - D) middle lamella
 - E) cytoskeleton
- 12) A plant *plasma membrane* is made up of _____ and _____.
- A) cellulose; lignin
 - B) phospholipids; carbohydrates
 - C) phospholipids; proteins
 - D) cellulose; cholesterol
 - E) phospholipids; cholesterol

13) Which of the following statements is correct?

- A) The plasma membrane is selectively permeable (differentially permeable).
- B) The movement of water across the membrane is called facilitated diffusion.
- C) Osmosis is a form of dialysis.
- D) Diffusion and dialysis are usually the same process.
- E) None of the above are correct.

14) If the proptoplast of plant cell A is hypertonic to the protoplast of adjacent plant cell B. Which way will water flow?

- A) From A to B
- B) From B to A
- C) Equally from B to A and A to B
- D) There will be no flow of water whatsoever
- E) None of the above are correct.

15) When a plant cell is placed in a *hypotonic solution*, the cell becomes _____.

- A) hypertonic
- B) plasmolyzed
- C) turgid
- D) osmotic
- E) flaccid

16) The free movement of water across a membrane is called _____.

- A) active transport
- B) simple diffusion
- C) plasmolysis
- D) osmosis
- E) dialysis

17) Of these three items - concentration gradient, energy, membrane proteins - which *two* are needed for active transport to take place?

- A) only a concentration gradient
- B) all three are needed for active transport to take place
- C) a concentration gradient and energy
- D) a concentration gradient and membrane proteins
- E) energy and membrane proteins

18) In drought conditions when soils are dry for long periods of time, plants cells become _____.

- A) hypertonic
- B) plasmolyzed
- C) turgid
- D) osmotic
- E) hydrated

- 19) _____ is(are) necessary for diffusion to take place.
- A) A cell membrane
 - B) Membrane proteins
 - C) Energy
 - D) A concentration gradient
 - E) More than one of the above are required.
- 20) Which of the following pigments is most abundant in chloroplasts?
- A) carotene
 - B) xanthophyll
 - C) melanin
 - D) chlorophyll
 - E) tannins
- 21) Which of the following statements is correct?
- A) Chloroplasts, leucoplasts, and chromoplasts are collectively called *plastids*.
 - B) Amyloplasts are filled with plant oils.
 - C) Mitochondria provides a location for photosynthesis to take place.
 - D) Stroma holds adjacent plant cells together.
 - E) Neither chloroplasts nor mitochondria are viewed as endosymbionts.
- 22) Plant pigments are specifically located within which of the following?
- A) thylakoid membranes.
 - B) stroma
 - C) plasma membranes
 - D) nuclei
 - E) golgi apparatus
- 23) Which of the following is *not* correct?
- A) During cellular respiration, glucose is chemically broken down to carbon dioxide, water, and ATP.
 - B) The inner membrane of mitochondria has numerous infoldings called *cristae*.
 - C) The matrix of mitochondria contains enzymes used in cellular respiration.
 - D) In some cells, the central vacuole takes up 90 percent of the cell volume.
 - E) Microbodies include peroxisomes, glyoxysomes, and ribosomes.
- 24) Which of the following is *not* found within the nucleus?
- A) chromatin
 - B) nucleolus
 - C) DNA
 - D) ribosomes
 - E) RNA

- 25) Which of the following terms is most closely associated with *grana*?
- A) leucoplasts
 - B) stroma
 - C) thylakoids
 - D) vacuoles
 - E) plastids
- 26) Carotenoids are found in which of the following?
- A) leucoplasts
 - B) amyloplasts
 - C) chloroplasts
 - D) chromoplasts
 - E) More than one of the above are correct.
- 27) Which of the following animals produces carotenoids?
- A) pea aphids
 - B) flamingos
 - C) chickens
 - D) butterflies
 - E) None of the above are correct—carotenoids are only produced by plants.
- 28) The mitochondrial equivalent to grana is(are) _____.
- A) the matrix
 - B) cristae
 - C) stroma
 - D) plasma membranes
 - E) ribosomes
- 29) What features in common with bacteria led scientists to conclude that chloroplasts and mitochondria evolved from bacteria?
- A) Their DNA is similar to the DNA of bacteria.
 - B) Their ribosomes are similar to those of bacteria.
 - C) Cell division in both is like bacterial cell division.
 - D) The chemical composition of their inner membranes is similar to those of bacteria.
 - E) Chloroplasts and mitochondria share all of these bacteria-like features.
- 30) Bacterial endosymbionts of sap-sucking insects provide needed _____ to their hosts.
- A) DNA
 - B) sugars
 - C) amino acids
 - D) fats
 - E) oils

31) Anthocyanin is found in which of the following organelles?

- A) central vacuole
- B) chromoplast
- C) chloroplast
- D) leucoplast
- E) endoplasmic reticulum

32) Regulating metabolism and controlling cellular reproduction by destruction of proteins is accomplished by which of the following?

- A) peroxisomes
- B) proteasomes
- C) glyoxysomes
- D) chromosomes
- E) tannosomes

33) The storage, modification, and packaging of proteins is accomplished by the _____.

- A) endoplasmic reticulum
- B) mitochondria
- C) proteasomes
- D) Golgi apparatus
- E) central vacuole

34) Most specifically, ribosomes are produced in the _____.

- A) chloroplast
- B) nucleus
- C) nucleolus
- D) central vacuole
- E) rough endoplasmic reticulum

35) Ribosomes are the sites of the synthesis of _____.

- A) proteins
- B) lipids
- C) carbohydrates
- D) nucleic acids
- E) fats and oils

36) The plastic ends of shoelaces that help prevent the shoelace from unraveling is called an aglet. What is the equivalent structure to an aglet on a chromosome?

- A) centromere
- B) chromatid
- C) chromatin
- D) nucleotide
- E) telomere

- 37) Which phase of mitosis appears to be the most opposite of prophase?
- A) anaphase
 - B) metaphase
 - C) telophase
 - D) cytokinesis
 - E) None of the above are correct.
- 38) Which of the following is correct?
- A) Chromosomes are always duplicated during prophase.
 - B) All cells must go through interphase after telophase.
 - C) Cytokinesis is the division of duplicated chromosomes.
 - D) Mitosis is the same as cell division.
 - E) The *Cell Cycle* typically includes interphase, mitosis, and cytokinesis.
- 39) In which phase of mitosis do chromatids separate?
- A) metaphase
 - B) prophase
 - C) anaphase
 - D) telophase
 - E) interphase
- 40) *Phragmoplasts* are most closely associated with which of the following?
- A) prophase
 - B) metaphase
 - C) anaphase
 - D) telophase
 - E) cytokinesis
- 41) The phragmoplast eventually becomes the _____.
- A) nucleus
 - B) cell wall
 - C) plasma membrane
 - D) middle lamella
 - E) None of the above are correct.
- 42) If a plant cell is placed in a *hypertonic solution*, so much water enters the protoplast that the cell becomes turgid.
- 43) The fluid mosaic model is the currently accepted explanation of membrane structure.
- 44) Proteins in the plasma membrane can reside on the outer or inner surface of the plasma membrane or extend completely through the plasma membrane.
- 45) Active transport of substances into a cell always requires the expenditure of energy by the cell, typically in the form of ATP.

- 46) Spindle fibers—composed of microtubules—stretch from the poles to the kinetochore of each chromatid.
- 47) The quantity of water entering a cell in an isotonic solution is equal to the amount of water exiting.
- 48) The cells of a wilted plant have lost so much water that they become *plasmolyzed*.
- 49) The *Endosymbiont Theory* postulates that some membrane-bound organelles of eukaryotic cells, such as chloroplasts and mitochondria, were once free-living bacteria.
- 50) If *vincristine*—a drug that disrupts microtubules—is applied to dividing cells, chromosomes will not form.
- 51) According to the Cell Theory, DNA is the genetic material in all cells.
- 52) The cell is the basic unit of life.
- 53) Cytokinesis—the division of the cytoplasm—separates the two identical daughter nuclei and their associated cytoplasm—into two cells.
- 54) Cell division enables plants to grow, repair wounds, and regenerate lost cells. Cell division can even lead to the production of new, genetically identical individuals, or *clones*.
- 55) Most plant cells spend the majority of the time in prophase.
- 56) *Tannosomes* are newly discovered organelles containing tannins, common to woody plants such as oak trees.