CHAPTER 3

Cells and Tissues

The basic unit of structure and function in the human body is the cell. Each of a cell's parts, or organelles, as well as the entire cell, is organized to perform a specific function. Cells have the ability to metabolize, grow and reproduce, move, and respond to stimuli. The cells of the body differ in shape, size, and in specific roles in the body. Cells that are similar in structure and function form tissues, which, in turn, construct the various body organs.

Student activities in this chapter include questions relating to the structure and function of the generalized animal cell and to the general arrangement of tissues and their contribution to the activities of the various body organs.

CELLS

Overview

1. Answer the following questions by inserting your responses in the answer blanks.

_____ 1.
_____ 2.
_____ 3.
_____ 4.
_____ 5.
_____ 6.
_____ 7.
_____ 8.
_____ 9.
_____ 10.

1–4. Name the four elements that make up the bulk of living matter.

5. Name the single most abundant material or substance in living matter.

6. Name the trace element most important for making bones hard.

7. Name the element, found in small amounts in the body, that is needed to make hemoglobin for oxygen transport.

8–12. Although there are many specific "jobs" that certain cells are able to do, name five functions common to all cells.

_____ 11.
_____ 12.

13. _____

14. _____

15. _____

16. _____

17. _____

13–15. List three different cell shapes.

16. Name the fluid, similar to seawater, that surrounds and bathes all body cells.

17. Name the flattened cells, important in protection, that fit together like tiles. (This is just one example of the generalization that a cell's structure is very closely related to its function in the body.)

Anatomy of a Generalized Cell

2. Complete the following table to fully describe the various cell parts. Insert your responses in the spaces provided under each heading.

Cell structure	Location	Function
	External boundary of the cell	Confines cell contents; regulates entry and exit of materials
Lysosomes		
	Scattered throughout the cell	Control release of energy from foods; form ATP
	Projections of the plasma membrane	Increase the membrane surface area
Golgi apparatus		
Nucleus		
	Two rod-shaped bodies near the nucleus	Direct formation of the mitotic spindle
Nucleolus		
Smooth ER		
Rough ER		
	Attached to membrane systems or scattered in the cytoplasm	Synthesize proteins
Chromatin		
	Scattered in cytoplasm	Detoxify alcohol, hydrogen peroxide, etc.
Inclusions		

3. Using the following list of terms, correctly label all cell parts indicated by leader lines in Figure 3–1. Then select different colors for each structure and use them to color the coding circles and the corresponding structures in the illustration.

- ◯ Plasma membrane
- ◯ Centriole(s)
- ◯ Chromatin thread(s)
- ◯ Golgi apparatus
- ◯ Microvilli
- ◯ Mitochondrion
- ◯ Nuclear membrane
- ◯ Nucleolus
- ◯ Rough endoplasmic reticulum (ER)
- ◯ Smooth endoplasmic reticulum (ER)

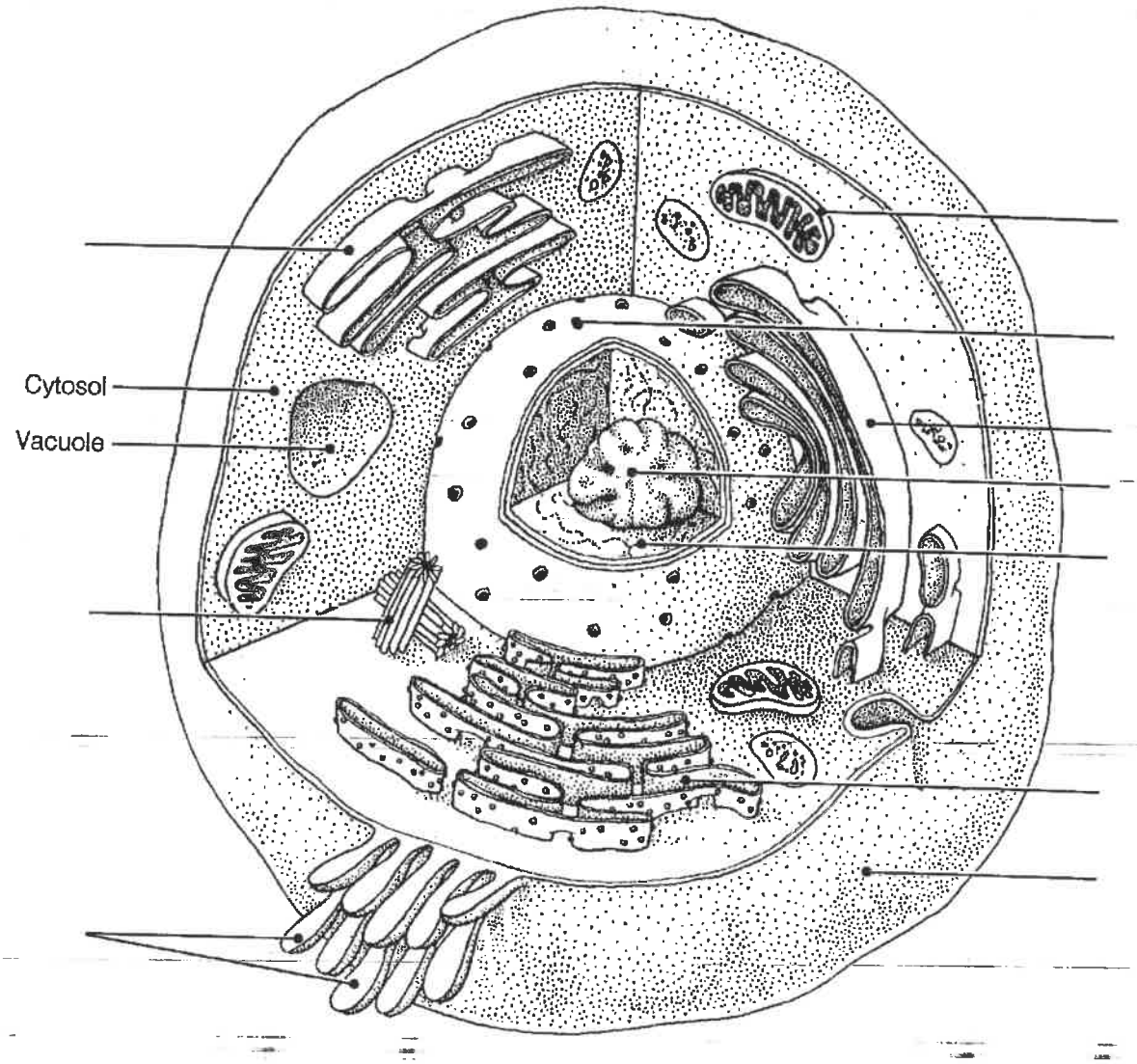


Figure 3–1

Cell Physiology

Membrane Transport

4. A semipermeable sac, containing 4% NaCl, 9% glucose, and 10% albumin, is suspended in a solution with the following composition: 10% NaCl, 10% glucose, and 40% albumin. Assume the sac is permeable to all substances *except* albumin. Using the key choices, insert the letter indicating the correct event in the answer blanks.

Key Choices

A. Moves into the sac B. Moves out of the sac C. Does not move

_____ 1. Glucose _____ 3. Albumin

_____ 2. Water _____ 4. NaCl

5. Figure 3–2 shows three microscopic fields (A–C) containing red blood cells. Arrows indicate the direction of net osmosis. Respond to the following questions, referring to Figure 3–2, by inserting your responses in the spaces provided.

1. Which microscopic field contains a *hypertonic* solution? _____

   The cells in this field are said to be _____

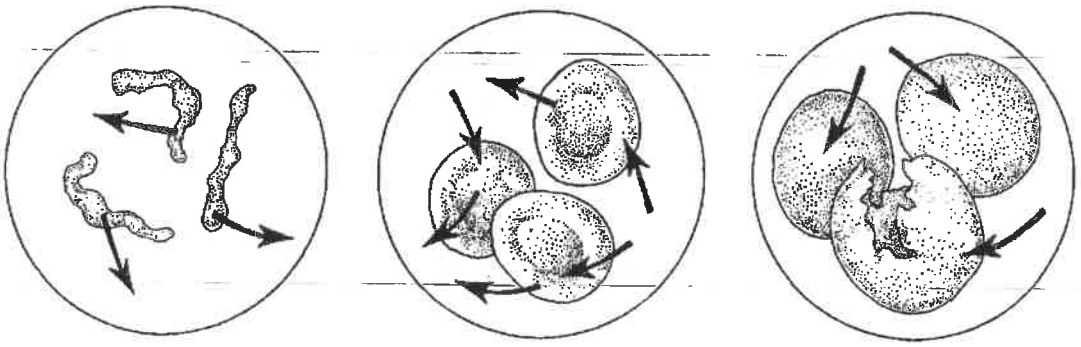
2. Which microscopic field contains an isotonic bathing solution? _____

   What does *isotonic* mean? _____

   _____

3. Which microscopic field contains a *hypotonic* solution? _____

   What is happening to the cells in this field and why? _____



A B C

Figure 3–2

6. Select the key choices that characterize each of the following statements. Insert the appropriate letter(s) or corresponding term(s) in the answer blanks.

Key Choices

A. Diffusion, simple
B. Diffusion, osmosis
C. Endocytosis
D. Exocytosis
E. Filtration
F. Solute pumping

_____ 1. Require ATP (cellular energy)

_____ 2. Driven by kinetic energy of the molecules

_____ 3. Driven by hydrostatic (fluid) pressure

_____ 4. Follow a concentration gradient

_____ 5. Proceeds against a concentration gradient; require(s) a carrier

_____ 6. A means of secreting cell products

_____ 7. Moves water through a semipermeable membrane

_____ 8. Transports amino acids, some sugars, and Na^+ through the plasma membrane

_____ 9. Provides for cellular uptake of solid or large particles from the cell exterior

_____ 10. Moves small or lipid-soluble solutes through the membrane

_____ 11. Includes phagocytosis, pinocytosis, and a receptor-mediated form.

7. Figure 3–3 represents a portion of a plasma membrane. Select two different colors for lipid and protein molecules. Color the coding circles and the corresponding molecules in the illustration. Then add a colored arrow for each substance shown inside and outside the cell indicating (a) its *direction* of transport through the membrane; and (b) its *means of transport* (that is, either directly through the lipid portion or by attachment to a protein carrier).

◯ Lipid molecules

◯ Protein molecules

Two types of molecules not shown here that contribute to plasma membrane structure are _____ and _____.

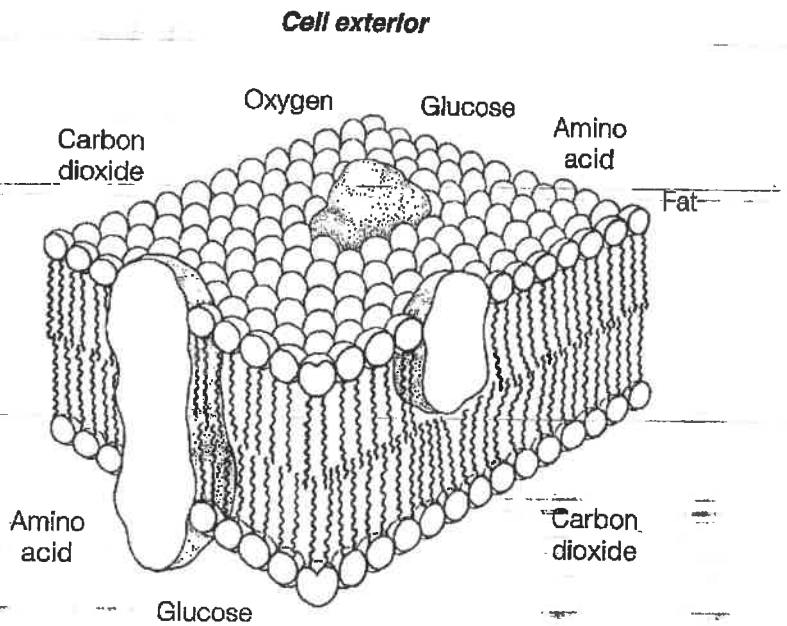


Figure 3–3

Cell Division

8. The following statements provide an overview of the structure of DNA (genetic material) and its role in the body. Choose responses from the key choices that complete the statements. Insert the appropriate answers in the answer blanks.

Key Choices

A. Adenine	G. Enzymes	M. Nucleotides	S. Ribosome
B. Amino acids	H. Genes	N. Old	T. Sugar (deoxyribose)
C. Bases	I. Growth	O. Phosphate	U. Template, or model
D. Codons	J. Guanine	P. Proteins	V. Thymine
E. Complementary	K. Helix	Q. Replication	W. Transcription
F. Cytosine	L. New	R. Repair	X. Uracil

DNA molecules contain information for building specific (1). In a three-dimensional view, a DNA molecule looks like a spiral staircase; this is correctly called a (2). The constant parts of DNA molecules are the (3) and (4) molecules, forming the DNA-ladder uprights, or backbones. The information of DNA is actually coded in the sequence of nitrogen-containing (5), which are bound together to form the "rungs" of the DNA ladder. When the four DNA bases are combined in different three-base sequences, called triplets, different (6) of the protein are called for. It is said that the N-containing bases of DNA are (7), which means that only certain bases can fit or interact together. Specifically, this means that (8) can bind with guanine, and adenine binds with (9).

The production of proteins involves the cooperation of DNA and RNA. RNA is another type of nucleic acid that serves as a "molecular slave" to DNA. That is, it leaves the nucleus and carries out the instructions of the DNA for the building of a protein on a cytoplasmic structure called a (10). When a cell is preparing to divide, in order for its daughter cells to have all its information, it must oversee the (11) of its DNA so that a "double dose" of genes is present for a brief period. For DNA synthesis to occur, the DNA must uncoil, and the bonds between the N-bases must be broken. Then the two single strands of (12) each act as a (13) for the building of a whole DNA molecule. When completed, each DNA molecule formed is half (14) and half (15). The fact that DNA replicates before a cell divides ensures that each daughter cell has a complete set of (16). Cell division, which then follows, provides new cells so that (17) and (18) can occur.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____

9. Identify the phases of mitosis depicted in Figure 3–4 by inserting the correct name in the blank under the appropriate diagram. Then select different colors to represent the structures listed below and use them to color in the coding circles and the corresponding structures in the illustration.

- ◯ Nuclear membrane(s), if present
- ◯ Nucleoli, if present
- ◯ Chromosomes
- ◯ Centrioles
- ◯ Spindle fibers

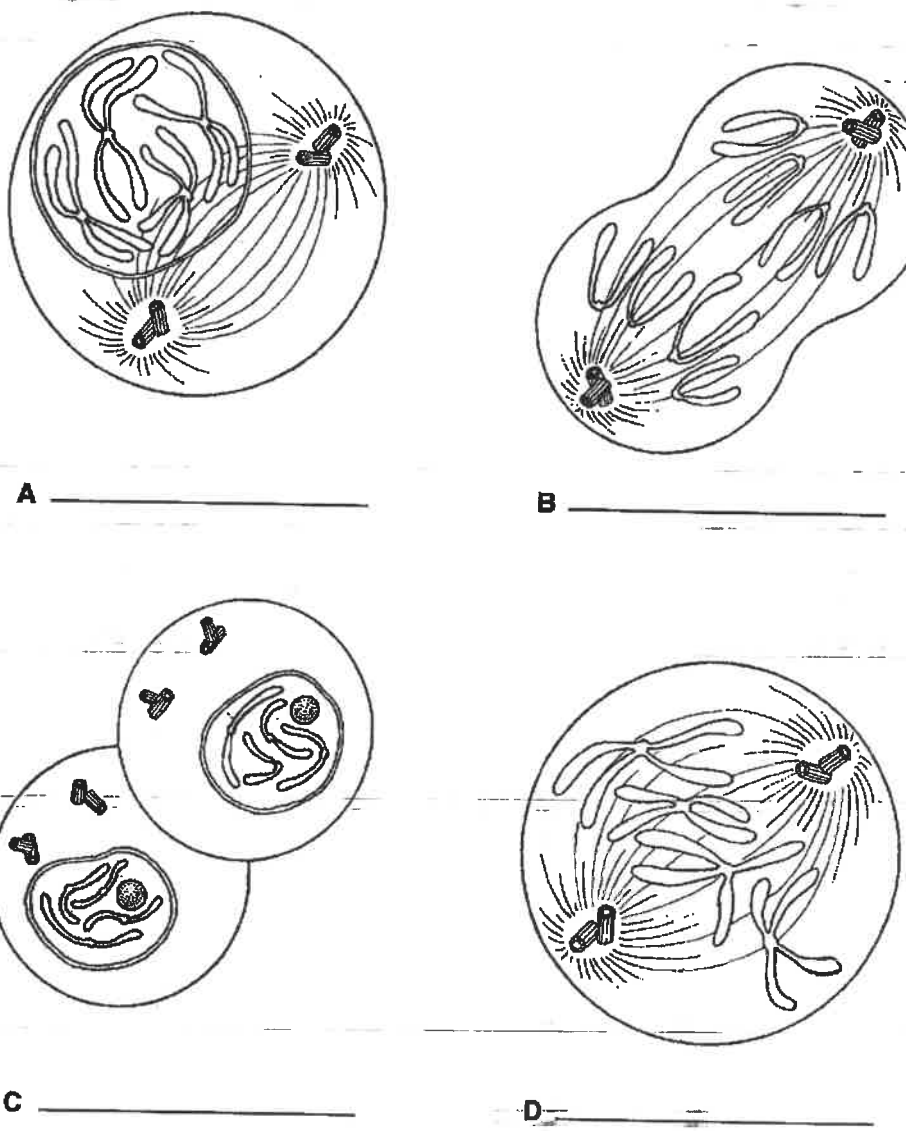


Figure 3–4

10. The following statements describe events that occur during the different phases of mitosis. Identify the phase by choosing the correct response(s) from key choices and inserting the letter(s) or term(s) in the answer blanks.

Key Choices

A. Anaphase C. Prophase E. None of these

B. Metaphase D. Telophase

_____ 1. Chromatin coils and condenses to form deeply staining bodies.

_____ 2. Centromeres break, and chromosomes begin migration toward opposite poles of the cell.

_____ 3. The nuclear membrane and nucleoli reappear.

_____ 4. When chromosomes cease their poleward movement, this phase begins.

_____ 5. Chromosomes align on the equator of the spindle.

_____ 6. The nucleoli and nuclear membrane disappear.

_____ 7. The spindle forms through the migration of the centrioles.

_____ 8. Chromosomal material replicates.

_____ 9. Chromosomes first appear to be duplex structures.

_____ 10. Chromosomes attach to the spindle fibers.

_____ 11. A cleavage furrow forms during this phase.

_____ 12. The nuclear membrane is absent during the entire phase.

_____ 13. Period during which a cell carries out its *usual* metabolic activities.

11. Complete the following statements. Insert your answers in the answer blanks.

_____ 1.
_____ 2.
_____ 3.
_____ 4.
_____ 5.
_____ 6.
_____ 7.

Division of the (1) is referred to as mitosis. Cytokinesis is division of the (2). The major structural difference between chromatin and chromosomes is that the latter are (3). Chromosomes attach to the spindle fibers by undivided structures called (4). If a cell undergoes nuclear division but not cytoplasmic division, the product is a (5). The structure that acts as a scaffolding for chromosomal attachment and movement is called the (6). (7) is the period of cell life when the cell is not involved in division.

Protein Synthesis

12. Figure 3–5 is a diagram illustrating protein synthesis. Select four different colors, and use them to color the coding circles and the corresponding structures in the diagram. Next, using the letters of the genetic code, label the nitrogen bases on strand 2 of the DNA double helix, on the mRNA strands, and on the tRNA molecules. Then, answer the questions that follow referring to Figure 3–5, inserting your answers in the answer blanks.

◯ Backbones of the DNA double helix ◯ tRNA molecules

◯ Backbone of the mRNA strands ◯ Amino acid molecules

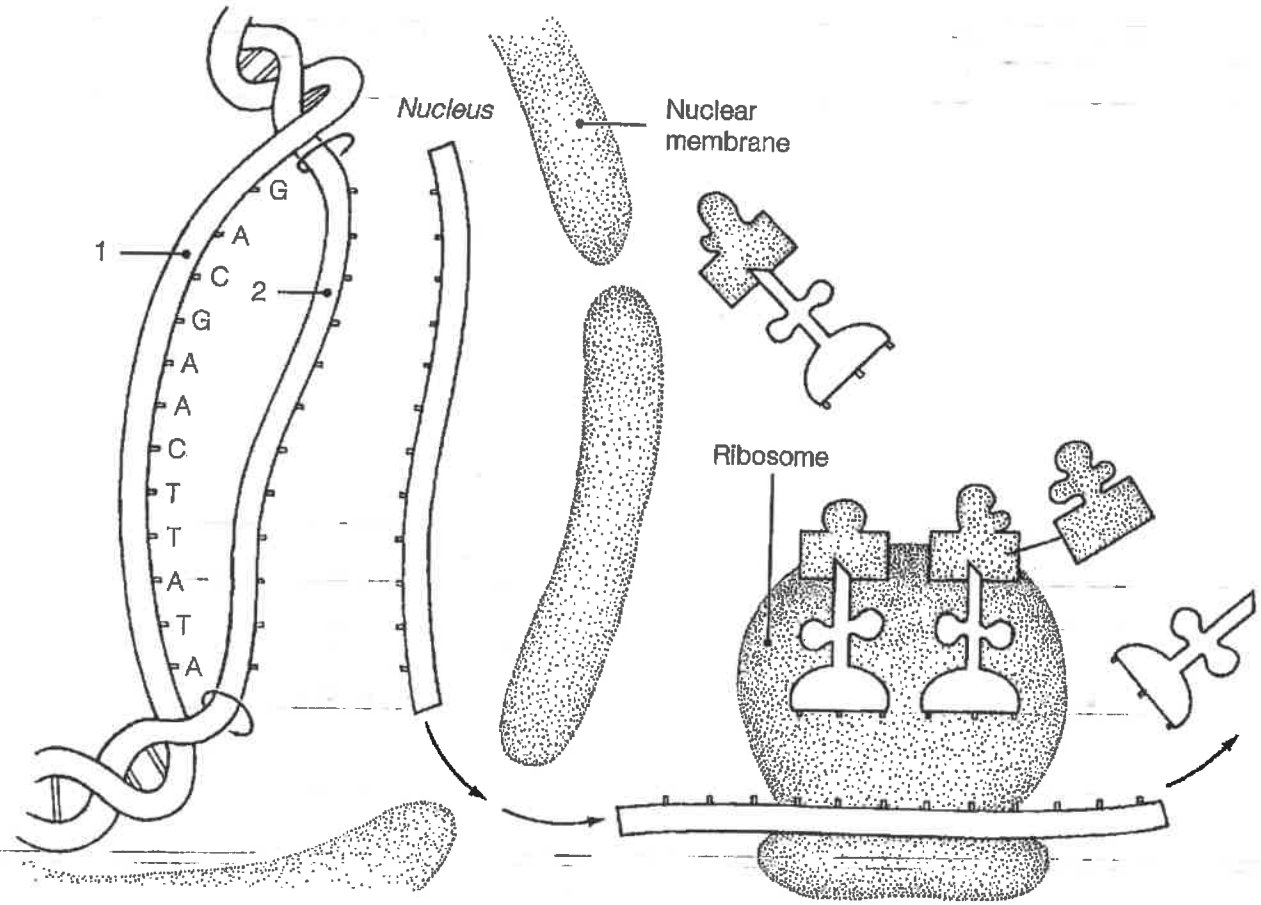


Figure 3–5

1. Transfer of the genetic message from DNA to mRNA is called _____.

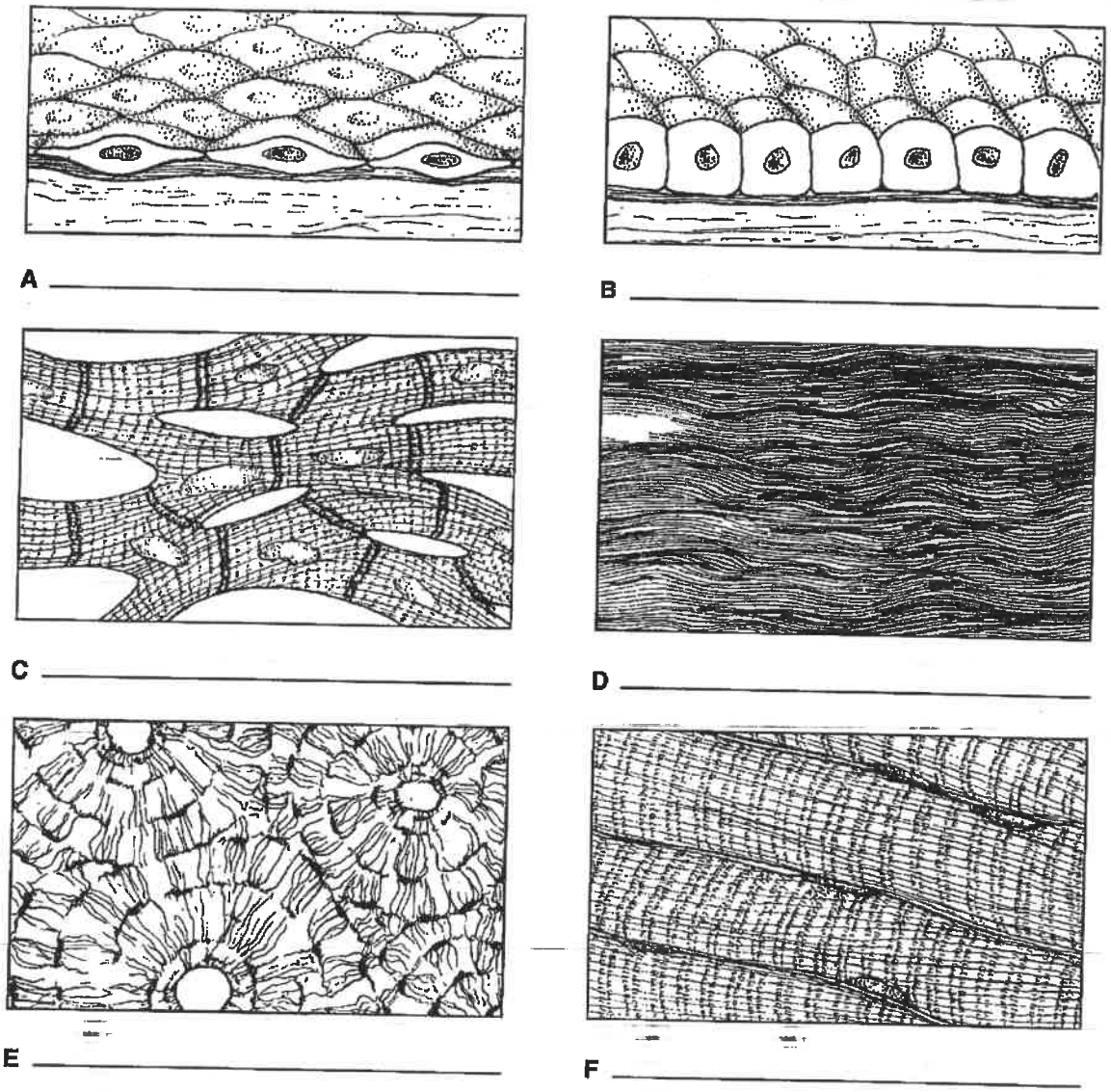
2. Assembly of amino acids according to the genetic information carried by mRNA is called _____.

3. The set of three nitrogen bases on tRNA that is complementary to an mRNA codon is called a _____. The complementary three-base sequence on DNA is called a _____.

BODY TISSUES

13. Twelve tissue types are diagrammed in Figure 3–6. Identify each tissue type by inserting the correct name in the blank below it on the diagram. Select different colors for the following structures and use them to color the coding circles and corresponding structures in the diagrams.

- ◯ Epithelial cells
- ◯ Nerve cells
- ◯ Muscle cells
- ◯ Matrix (Where found, matrix should be colored differently from the living cells of that tissue type. Be careful, this may not be as easy as it seems!)

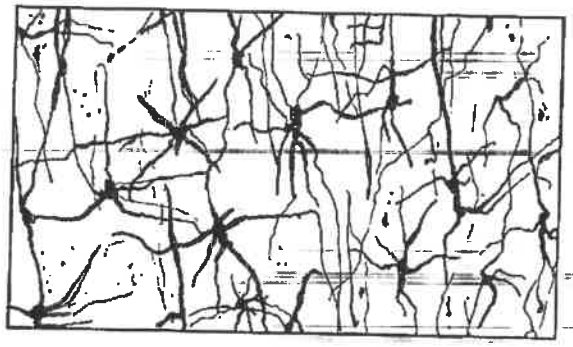


A _____ B _____

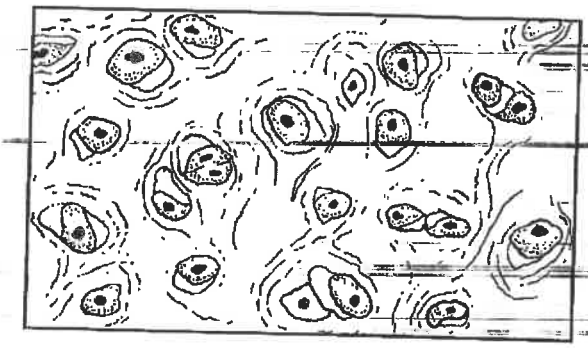
C _____ D _____

E _____ F _____

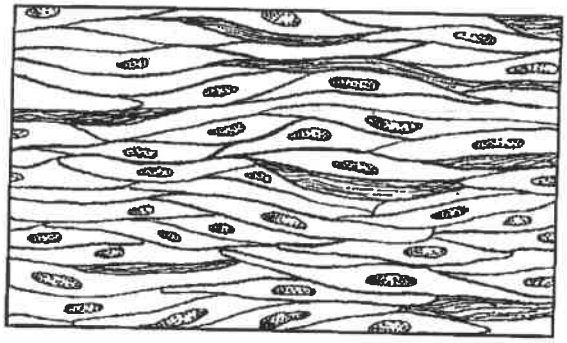
Figure 3–6, A–F



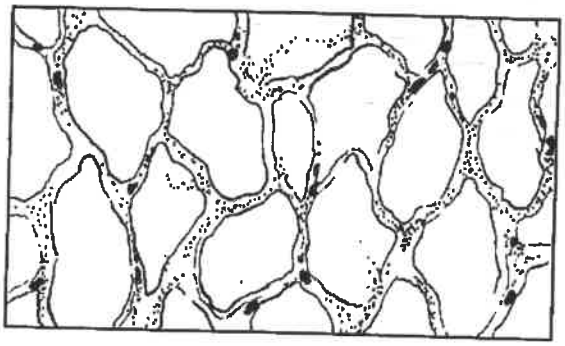
G _____



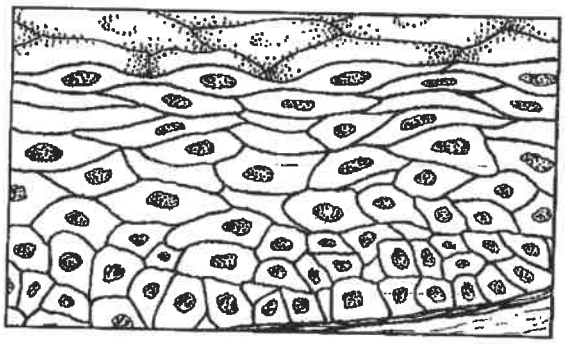
H _____



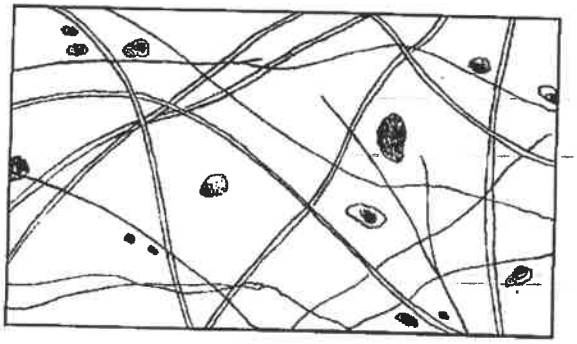
I _____



J _____



K _____



L _____

Figure 3–6, G–L

14. Describe briefly how the particular structure of a neuron relates to its function in the body. _____

15. Using key choices, correctly identify the *major* tissue types described. Enter the appropriate letter or tissue type term in the answer blanks.

Key Choices

A. Connective B. Epithelium C. Muscle D. Nervous

_____ 1. Forms mucous, serous, and epidermal membranes

_____ 2. Allows for organ movements within the body

_____ 3. Transmits electrochemical impulses

_____ 4. Supports body organs

_____ 5. Cells of this tissue may absorb and/or secrete substances

_____ 6. Basis of the major controlling system of the body

_____ 7. The cells of this tissue shorten to exert force

_____ 8. Forms hormones

_____ 9. Packages and protects body organs

_____ 10. Characterized by having large amounts of nonliving matrix

_____ 11. Allows you to smile, grasp, swim, ski, and shoot an arrow

_____ 12. Most widely distributed tissue type in the body

_____ 13. Forms the brain and spinal cord

16. Using key choices, identify the following specific type(s) of epithelial tissue. Enter the appropriate letter or classification term in the answer blanks.

Key Choices

A. Pseudostratified columnar (ciliated) C. Simple cuboidal E. Stratified squamous

B. Simple columnar D. Simple squamous F. Transitional

_____ 1. Lines the esophagus and forms the skin epidermis

_____ 2. Forms the lining of the stomach and small intestine

_____ 3. Best suited for areas subjected to friction

_____ 4. Lines much of the respiratory tract

_____ 5. Propels substances (e.g., mucus) across its surface

_____ 6. Found in the bladder lining; peculiar cells that slide over one another

_____ 7. Forms thin serous membranes; a single layer of flattened cells

17. Epithelium exhibits many plasma membrane modifications. Figure 3–7 depicts some of these modifications.

First: Choose a color for the coding circles and the corresponding structures in the figure.

- ◯ Epithelial cell cytoplasm
- ◯ Epithelial cell nucleus
- ◯ Nerve fibers
- ◯ Connective tissue
- ◯ Blood vessel

Second: Correctly identify the following structures or regions by labeling the appropriate leader lines using terms from the list below:

A. Apical region	D. Cilia	G. Epithelium
B. Basement membrane	E. Connective tissue	H. Microvilli
C. Capillary	F. Desmosome	I. Tight junctions

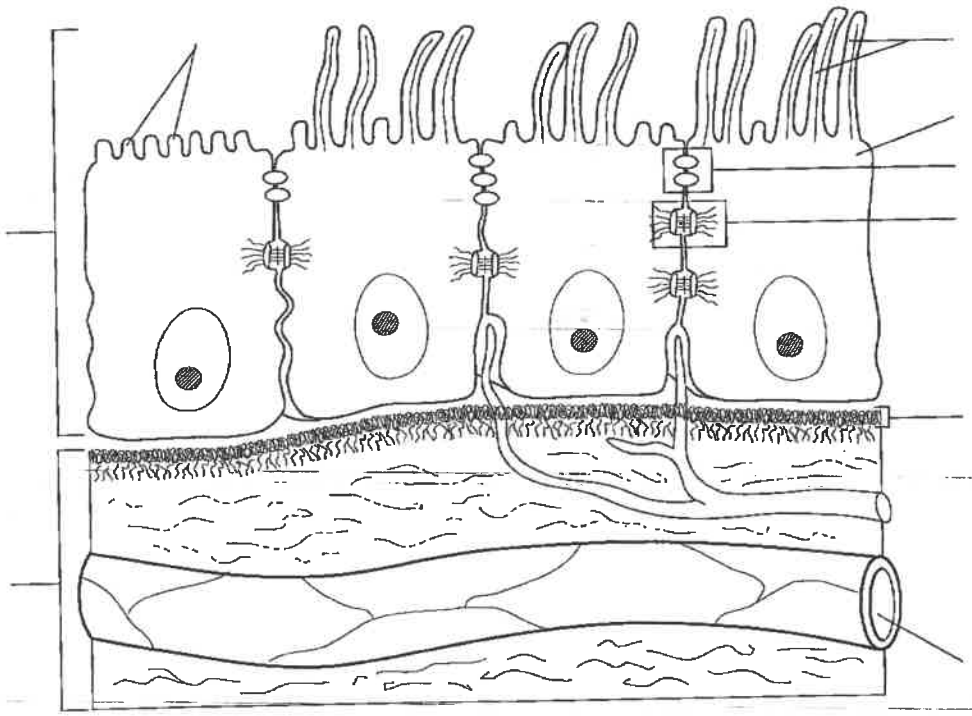


Figure 3–7

18. The three types of muscle tissue exhibit certain similarities and differences. Check (✓) the appropriate spaces in the following table to indicate which muscle types exhibit each characteristic.

Characteristic	Skeletal	Cardiac	Smooth
1. Voluntarily controlled			
2. Involuntarily controlled			
3. Banded appearance			
4. Single nucleus in each cell			
5. Multinucleate			
6. Found attached to bones			
7. Allows you to direct your eyeballs			
8. Found in the walls of stomach, uterus, and arteries			
9. Contains spindle-shaped cells			
10. Contains cylindrical cells with branching ends			
11. Contains long, nonbranching cylindrical cells			
12. Displays intercalated disks			
13. Concerned with locomotion of the body as a whole			
14. Changes the internal volume of an organ as it contracts			
15. Tissue of the circulatory pump			

19. Circle the term that does not belong in each of the following groupings.

1. Collagen	Cell	Matrix	Cell product
2. Cilia	Flagellum	Microvilli	Elastic fibers
3. Glands	Bones	Epidermis	Mucosae
4. Adipose	Hyaline	Osseous	Nervous
5. Blood	Smooth	Cardiac	Skeletal

20. Using key choices, identify the following connective tissue types. Insert the appropriate letter or corresponding term in the answer blanks.

Key Choices

A. Adipose connective tissue
B. Areolar connective tissue
C. Dense fibrous connective tissue
D. Osseous tissue
E. Reticular connective tissue
F. Hyaline cartilage

_____ 1. Provides great strength through parallel bundles of collagenic fibers; found in tendons

_____ 2. Acts as a storage depot for fat

_____ 3. Composes the dermis of the skin

_____ 4. Forms the bony skeleton

_____ 5. Composes the basement membrane and packages organs; includes a gel-like matrix with all categories of fibers and many cell types

_____ 6. Forms the embryonic skeleton and the surfaces of bones at the joints; reinforces the trachea

_____ 7. Provides insulation for the body

_____ 8. Structurally amorphous matrix, heavily invaded with fibers; appears glassy and smooth

_____ 9. Contains cells arranged concentrically around a nutrient canal; matrix is hard due to calcium salts

_____ 10. Forms the stroma or internal "skeleton" of lymph nodes, the spleen, and other lymphoid organs

Tissue Repair

21. For each of the following statements about tissue repair that is true, enter *T* in the answer blank. For each false statement, correct the underlined words by writing the correct words in the answer blank.

_____ 1. The nonspecific response of the body to injury is called regeneration.

_____ 2. Intact capillaries near an injury dilate, leaking plasma, blood cells, and antibodies, which cause the blood to clot. The clot at the surface dries to form a scab.

_____ 3. During the first phase of tissue repair, capillary buds invade the clot, forming a delicate pink tissue called endodermal tissue.

_____ 4. When damage is not too severe, the surface epithelium migrates beneath the dry scab and across the surface of the granulation tissue. This repair process is called proliferation.

5. If tissue damage is very severe, tissue repair is more likely to occur by fibrosis, or scarring.

6. During fibrosis, fibroblasts in the granulation tissue lay down keratin fibers, which form a strong, compact, but inflexible mass.

7. The repair of cardiac muscle and nervous tissue occurs only by fibrosis.

DEVELOPMENTAL ASPECTS OF CELLS AND TISSUES

22. Correctly complete each statement by inserting your responses in the answer blanks.

1. During embryonic development, cells specialize to form (1).
2. Mitotic cell division is very important for overall body (2).
3. All tissues except (3) tissue continue to undergo cell division until the end of adolescence. After this time, (4) tissue also becomes amitotic. When amitotic tissues are damaged, they are replaced by (5) tissue, which does not function in the same way as the original tissue. This is a serious problem when heart cells are damaged.
4.
5.
6. Aging begins almost as soon as we are born. Three explanations of the aging process have been offered. One states that (6) insults, such as the presence of toxic substances in the blood, are important. Another theory states that external (7) factors, such as X-rays, help to cause aging. A third theory suggests that aging is programmed in our (8). Three examples of aging processes seen in all people are (9), (10), and (11).
7.
8.
9.
10.
11. Neoplasms occur when cells "go wild" and the normal controls of cell (12) are lost. The two types of neoplasms are (13) and (14). The (15) type tends to stay localized and have a capsule. The (16) type is likely to invade other body tissues and spread to other (distant) parts of the body. To correctly diagnose the type of neoplasm, a microscopic examination of the tissue called a (17) is usually done. Whenever possible, (18) is the treatment of choice for neoplasms.
12.
13.
14.
15. An overgrowth of tissue that is not considered to be a neoplasm is referred to as (19). Conversely, a decrease in the size of an organ or tissue, resulting from loss of normal stimulation, is called (20).
16.
17.
18.
19.
20.

CHAPTER 4

Skin and Body Membranes

Body membranes, which cover body surfaces, line its cavities, and form protective sheets around organs, fall into two major categories. These are epithelial membranes (skin epidermis, mucosae, and serosae) and the connective tissue synovial membranes.

Topics for review in this chapter include a comparison of structure and function of various membranes, anatomical characteristics of the skin (composed of the connective tissue dermis and the epidermis) and its derivatives, and the manner in which the skin responds to both internal and external stimuli to protect the body.

CLASSIFICATION OF BODY MEMBRANES

1. Complete the following table relating to body membranes. Enter your responses in the areas left blank.

Membrane	Tissue type (epithelial/connective)	Common locations	Functions
Mucous			
Serous			
Cutaneous			
Synovial			

2. Four simplified diagrams are shown in Figure 4–1. Select different colors for the membranes listed below, and use them to color the coding circles and the corresponding structures.

- ◯ Cutaneous membrane
- ◯ Mucosae
- ◯ Visceral pleura (serosa)
- ◯ Parietal pleura (serosa)
- ◯ Visceral pericardium (serosa)
- ◯ Parietal pericardium (serosa)
- ◯ Synovial membrane

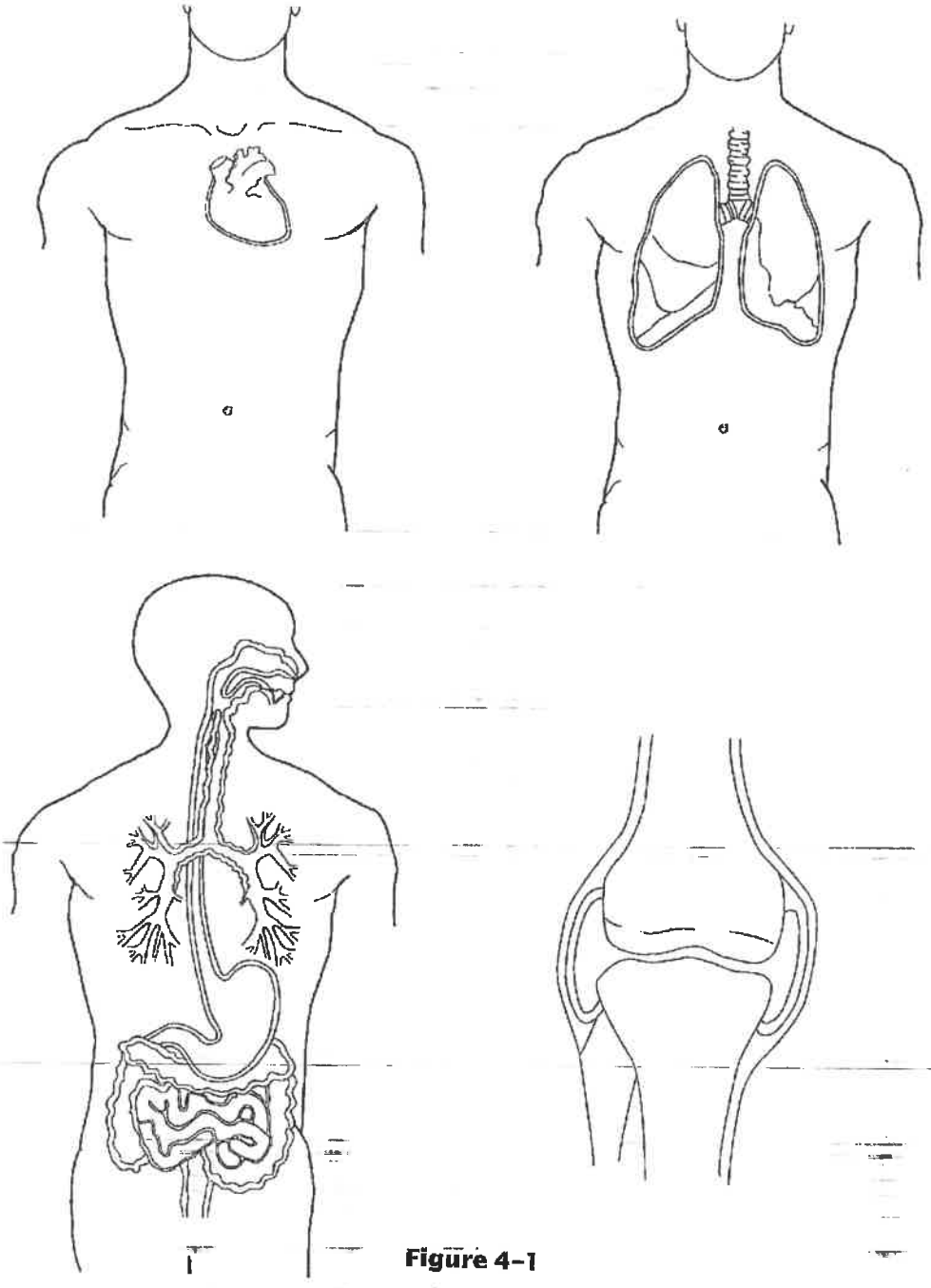


Figure 4–1

INTEGUMENTARY SYSTEM (SKIN)

Basic Structure and Function

3. Figure 4–2 depicts a longitudinal section of the skin. Label the skin structures and areas indicated by leader lines and brackets on the figure. Select different colors for the structures below and color the coding circles and the corresponding structures on the figure.

- ◯ Arrector pili muscle
- ◯ Adipose tissue
- ◯ Hair follicle
- ◯ Nerve fibers
- ◯ Sweat (sudoriferous) gland
- ◯ Sebaceous gland

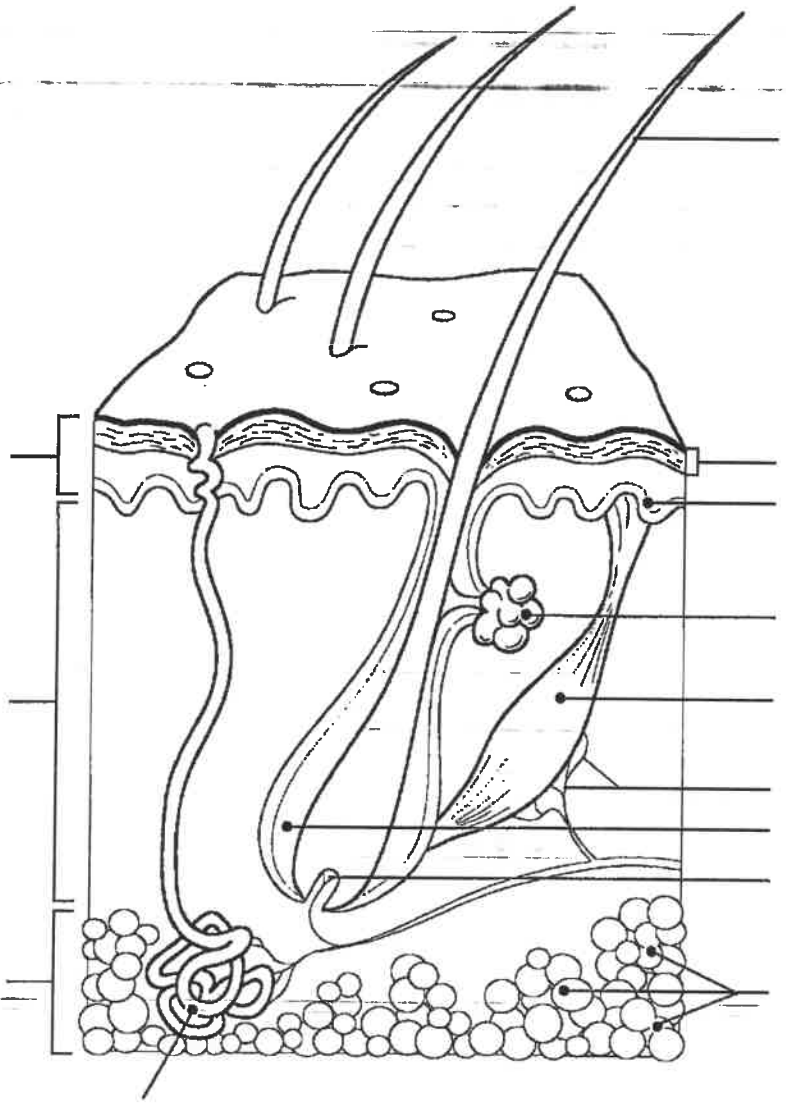


Figure 4–2

4. The more superficial cells of the epidermis become less viable and ultimately die. What two factors account for this natural demise of the epidermal cells?

1. _____

2. _____

_____

5. Complete the following statements in the blanks provided.

_____ 1. Radiation from the skin surface and evaporation of sweat are two ways in which the skin helps to get rid of body (1).

_____ 2. Fat in the (2) tissue layer beneath the dermis helps to insulate the body.

_____ 3. The waterproofing protein found in the epidermal cells is called (3).

_____ 4. A vitamin that is manufactured in the skin is (4).

_____ 5. A localized concentration of melanin is (5).

_____ 6. Wrinkling of the skin is due to loss of the (6) of the skin.

_____ 7. A decubitus ulcer results when skin cells are deprived of (7).

_____ 8. (8) is a bluish cast of the skin resulting from inadequate oxygenation of the blood.

6. Using key choices, choose all responses that apply to the following descriptions. Enter the appropriate letter(s) or term(s) in the answer blanks.

Key Choices

A. Stratum corneum
B. Stratum basale
C. Stratum granulosum
D. Stratum lucidum
E. Papillary layer
F. Reticular layer
G. Epidermis as a whole
H. Dermis as a whole

_____ 1. Translucent cells, containing keratin

_____ 2. Dead cells

_____ 3. Dermis layer responsible for fingerprints

_____ 4. Vascular region

_____ 5. Epidermal region involved in rapid cell division; most inferior epidermal layer

_____ 6. Scalelike cells full of keratin that constantly flake off

_____ 7. Site of elastic and collagen fibers

_____ 8. Site of melanin formation

_____ 9. Major skin area from which the derivatives (hair, nails) arise

Appendages

7. For each true statement, write *T*. For each false statement, correct the underlined word(s) and insert your correction in the answer blank.

_____ 1. Greater amounts of the pigment carotene are produced when the skin is exposed to the sun.

_____ 2. The most abundant protein in dead epidermal structures such as hair and nails is melanin.

_____ 3. Sebum is an oily mixture of lipids, cholesterol, and cell fragments.

_____ 4. The oldest epidermal cells in the epidermis are found in the stratum basale.

_____ 5. The externally observable part of a hair is called the root.

_____ 6. The epidermis provides mechanical strength to the skin.

8. Figure 4–3 is a diagram of a cross-sectional view of a hair in its follicle. Complete this figure by following the directions in steps 1–3.

1. Identify the two portions of the follicle wall by placing the correct name of the sheath at the end of the appropriate leader line.
2. Use different colors to color these regions.
3. Label, color code, and color the three following regions of the hair.

◯ Cortex ◯ Cuticle ◯ Medulla

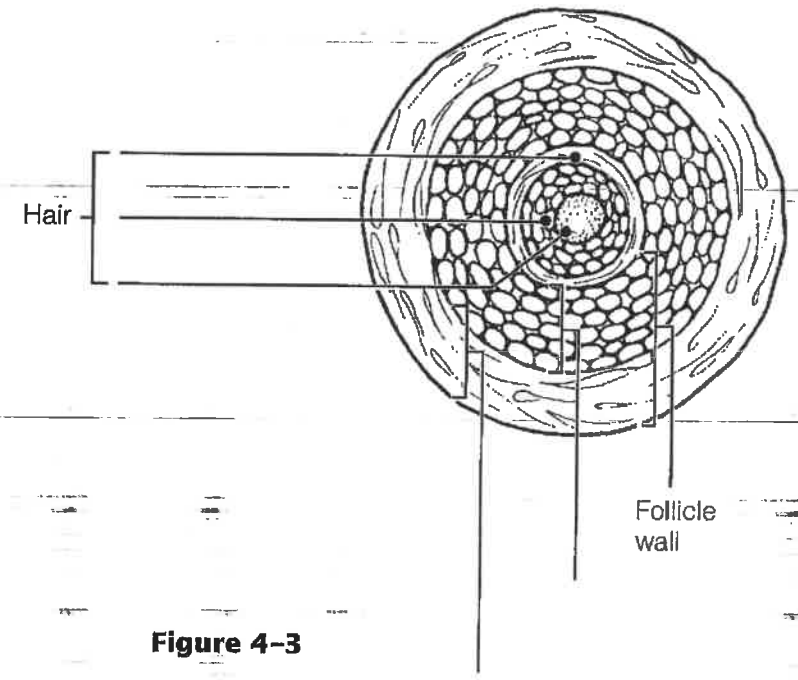


Figure 4–3

9. Using key choices, complete the following statements. Insert the appropriate letter(s) or term(s) in the answer blanks.

Key Choices

A. Arrector pili C. Hair E. Sebaceous glands G. Sweat gland (eccrine)

B. Cutaneous receptors D. Hair follicle(s) F. Sweat gland (apocrine)

_____ 1. A blackhead is an accumulation of oily material produced by (1).

_____ 2. Tiny muscles attached to hair follicles that pull the hair upright during fright or cold are called (2).

_____ 3. The most numerous variety of perspiration gland is the (3).

_____ 4. A sheath formed of both epithelial and connective tissues is the (4).

_____ 5. A less numerous variety of perspiration gland is the (5). Its secretion (often milky in appearance) contains proteins and other substances that favor bacterial growth.

_____ 6. (6) is found everywhere on the body except the palms of the hands, soles of the feet, and lips, and primarily consists of dead keratinized cells.

_____ 7. (7) are specialized nerve endings that respond to temperature and touch, for example.

_____ 8. (8) become more active at puberty.

_____ 9. Part of the heat-liberating apparatus of the body is the (9).

10. Circle the term that does not belong in each of the following groupings.

1. Sebaceous gland Hair Arrector pili Epidermis
2. Radiation Absorption Conduction Evaporation
3. Stratum corneum Nails Hair Stratum basale
4. Freckles Blackheads Moles Melanin
5. Scent glands Eccrine glands Apocrine glands Axilla
6. Cyanosis Erythema Wrinkles Pallor
7. Keratin Carotene Melanin Hemoglobin

Homeostatic Imbalances of the Skin

11. Overwhelming infection is one of the most important causes of death in burn patients. What is the other major problem they face, and what are its possible consequences?

12. This section reviews the severity of burns. Using the key choices, select the correct burn type for each of the following descriptions. Enter the correct answers in the answer blanks.

Key Choices

A. First-degree burn B. Second-degree burn C. Third-degree burn

_____ 1. Full-thickness burn; epidermal and dermal layers destroyed; skin is blanched

_____ 2. Blisters form

_____ 3. Epidermal damage, redness, and some pain (usually brief)

_____ 4. Epidermal and some dermal damage; pain; regeneration is possible

_____ 5. Regeneration impossible; requires grafting

_____ 6. Pain is absent because nerve endings in the area are destroyed

13. What is the importance of the "rule of nines" in treatment of burn patients?

14. Fill in the type of skin cancer which matches each of the following descriptions:

_____ 1. Epithelial cells, not in contact with the basement membrane, develop lesions; metastasizes.

_____ 2. Cells of the lowest level of the epidermis invade the dermis and hypodermis; exposed areas develop ulcer; slow to metastasize.

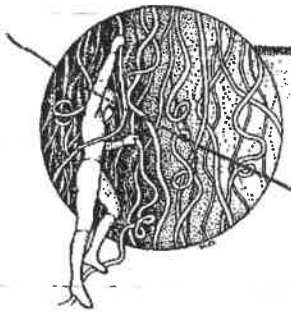
_____ 3. Rare but often deadly cancer of pigment-producing cells.

15. What does ABCD mean in reference to examination of pigmented areas? _____

DEVELOPMENTAL ASPECTS OF THE SKIN AND BODY MEMBRANES

16. Match the choices (letters or terms) in Column B with the appropriate descriptions in Column A.

Column A	Column B
_____ 1. Skin inflammations that increase in frequency with age	A. Acne
_____ 2. Cause of graying hair	B. Cold intolerance
_____ 3. Small white bumps on the skin of newborn babies, resulting from accumulations of sebaceous gland material	C. Dermatitis
_____ 4. Reflects the loss of insulating subcutaneous tissue with age	D. Delayed-action gene
_____ 5. A common consequence of accelerated sebaceous gland activity during adolescence	E. Lanugo
_____ 6. Oily substance produced by the fetus's sebaceous glands	F. Milia
_____ 7. The hairy "cloak" of the fetus	G. Vernix caseosa



INCREDIBLE JOURNEY

A Visualization Exercise for the Skin

Your immediate surroundings resemble huge grotesquely twisted vines. . . . you begin to climb upward.

17. Where necessary, complete statements by inserting the missing words in the answer blanks.

_____ 1. For this trip, you are miniaturized for injection into your host's skin. Your journey begins when you are deposited in a soft

_____ 2. gel-like substance. Your immediate surroundings resemble huge grotesquely twisted vines. But when you peer carefully at the closest "vine," you realize you are actually seeing connective tissue fibers. Although tangled together, most of the fibers are fairly straight and look like strong cables. You identify these as the __(1)__ fibers. Here and there are fibers that resemble coiled springs. These must be the __(2)__ fibers that help to give skin its springiness. At this point,