

SLO Test

Chapter 1: Introduction to anatomy and physiology

- a. Anatomy (structure) vs physiology (function)
- b. Order of organization of the body (cells-tissue-organs-system)
- c. Visceral (on organ) vs Parietal (on cavity wall)
- d. 3 planes / cuts: sagittal (left/right), coronal (front/anterior and back/posterior), transverse (top / superior and bottom /inferior)
- e. Cavities: cranial, vertebral, thoracic, abdominal, pelvic
- f. Regions: R/L hypochondriac, R/L lumbar, R/L inguinal, epi / hypo gastric, umbilical
- g. Homeostasis: negative feedback

Chapter 2: introduction to chemistry

Inorganic –

Definitions: Elements /ions/ compounds/ molecules

Definitions: pH, Acid (below 7) / base (above 7) / neutral (7)

Organic compounds -

Protein – amino acids, peptide bond, polypeptide

Fats – glycerol + fatty acid, triglycerides, oils, adipose, saturated / unsaturated

Carbohydrates – glucose /monosaccharide, disaccharide, polysaccharide / starch

Chapter 3 cell

Label - Cell parts – picture

Centrioles, Cilium, Golgi apparatus, plasmalemma, mitochondria, nucleus, rough endoplasmic reticulum, smooth Endoplasmic reticulum, lysosome

Cell cycle: Growth – synthesis – growth – mitosis (pmat)

Mitosis vs meiosis

Mutations

Metabolism: anabolism, catabolism; glycolysis, Kreb's cycle, Electron transport chain

Chapter 4: Tissue

Label – tissue (layers and shape)- picture

Blood, Bone, cardiac muscle, cartilage, dense regular, nerve, simple columnar, simple cuboidal, simple squamous, stratified squamous, stratum corneum, subcutaneous, sudoriferous gland,

Epithelial – basement membrane, avascular, packed, nerve supply, mitosis

Connective – Matrix (ground substance, fibers), cells

Muscle – smooth, cardiac (intercalated disc), skeletal

Nerve – Dendrite, cell body, axon

Skin:

Label – skin part- picture

Arrector pili, Dermis, Dermal papillia, epidermis, hair follicle, hair shaft, hypodermis / subcutaneous, pacinian corpuscle, sebaceous gland

Functions: protection, sensation, thermoregulation

Body temperature regulation – homeostasis (increase, decrease)

3 types of burns

3 layers of skin

Bone:

Label: bones- picture

Acromion process, carpals, clavical, Coronal suture, fibula, frontal, greater trochanter, humerus, iliac crest, patella, mandible, nasal, orbital foramen, radius, rib, xiphoid process, vomer, vertebrae, ulna, tarsals, Tibia, zygomatic

Functions: protection, support, levels with muscles, Ca storage, hematopoiesis

Bone growth: intramembranous vs endochondrial

Articulations:

Types: synarthrosis, amphiarthrosis, diarthrosis (hinge, pivot, ect..)

Movements: circumduction, flexion, extension, ect..

Knee : acl, pcl, collateral, meniscus

Muscle:

Label: muscles- picture

Biceps brachii, biceps femoris, brachioradialis, calcaneal tendon, epicranial aponeurosis, gluteus maximus, pectoralis, masseter, orbicularis oculi, rectus abdominis, serratus anterior, sternocleidomastoid, tibialis anterior, trapezius

Functions: movement gross, movement internal, thermogenic, heart beat, regulate organ volume.
Ions involved

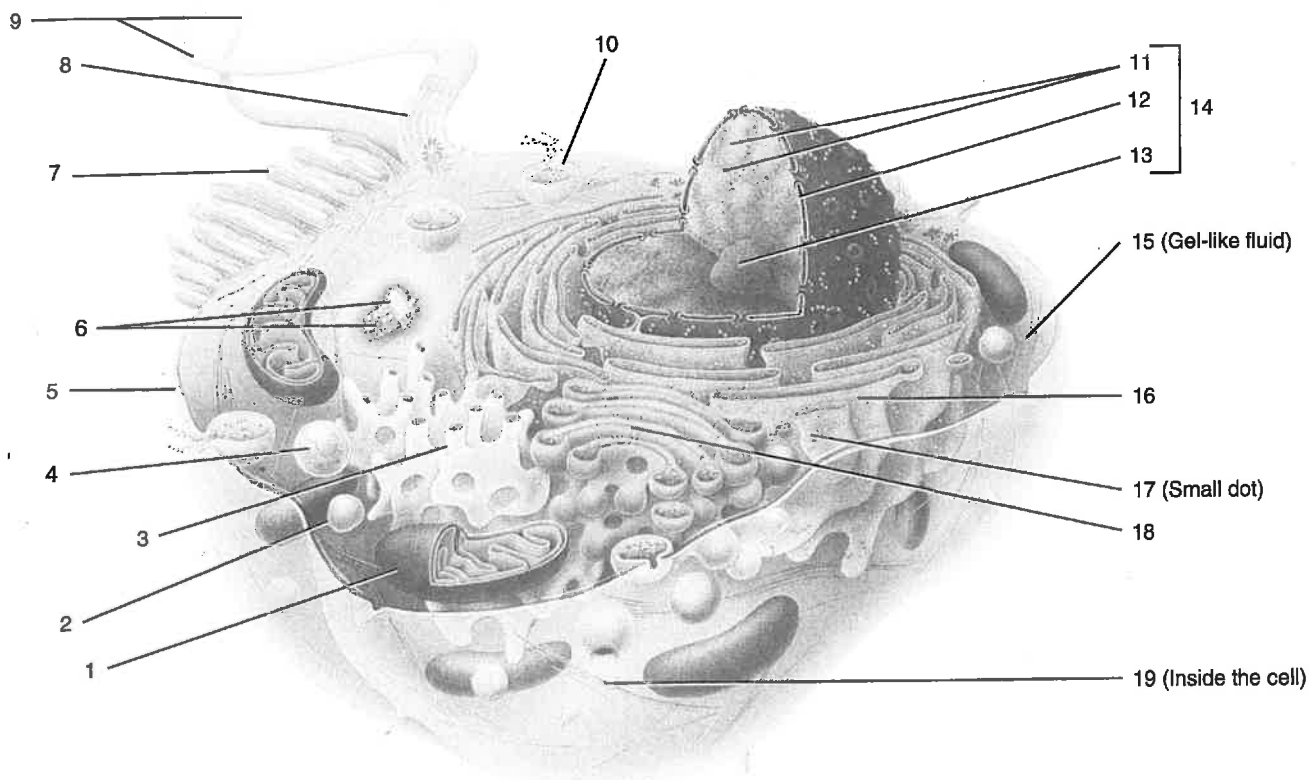
Nerve:

Label: neurons- picture

Axon, cell body, dendrite, myelin sheath, node of Ranvier,

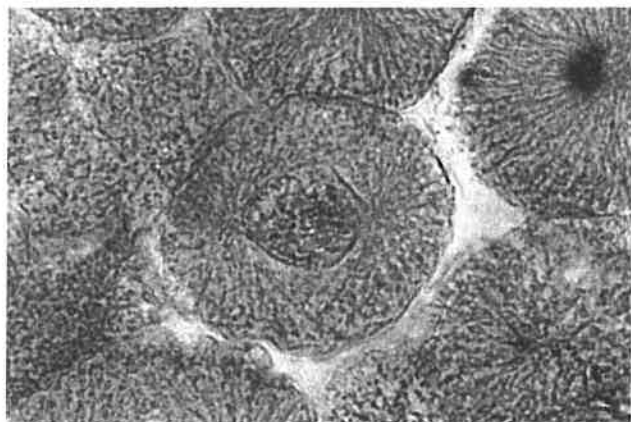
Functions: coordinate/ control

Reflex arc – receptor, effector/sensory, interneurons, effector/motor, effector/action

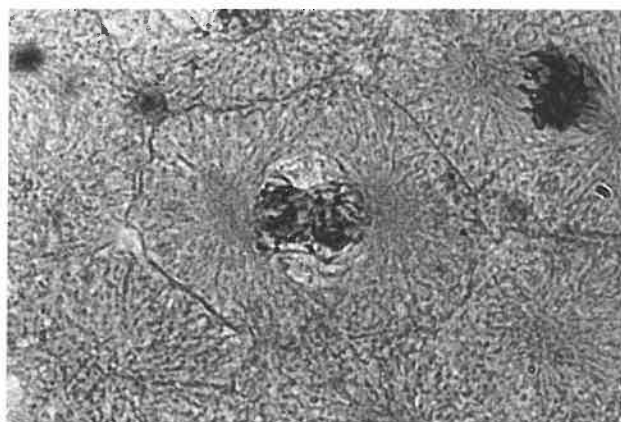


- | | | |
|--------------------------------|-------------------------------|---------------------------------|
| 1 mitochondrion | 8 microtubules (cytoskeleton) | 15 cytoplasm |
| 2 peroxisome | 9 flagella | 16 rough endoplasmic reticulum |
| 3 smooth endoplasmic reticulum | 10 secretory vesicle | 17 ribosome |
| 4 lysosome | 11 chromatin | 18 Golgi complex |
| 5 plasma membrane | 12 nuclear membrane | 19 microfilament (cytoskeleton) |
| 6 centrioles | 13 nucleolus | |
| 7 microvillus | 14 nucleus | |

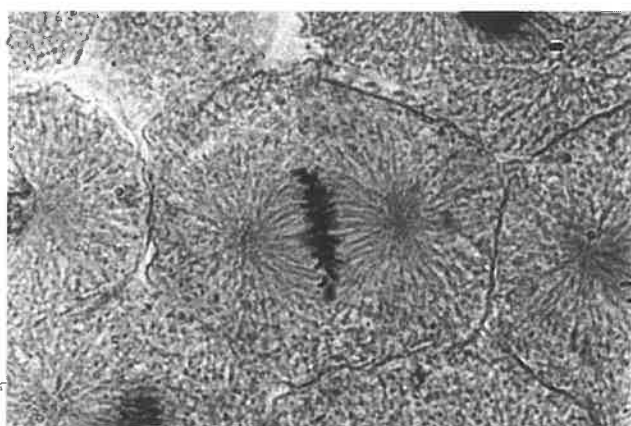
FIGURE 4.1 Sectional drawing of a cell.



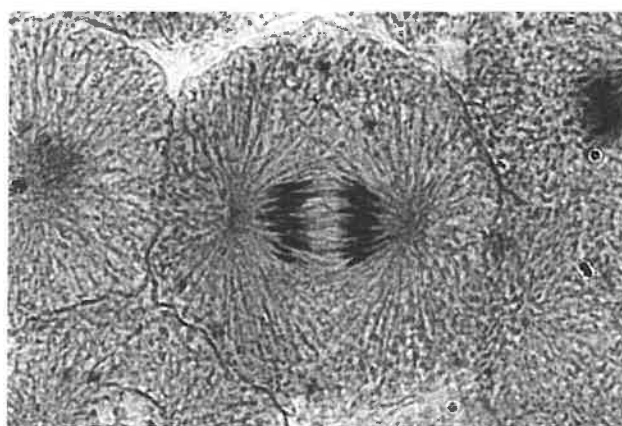
(a)



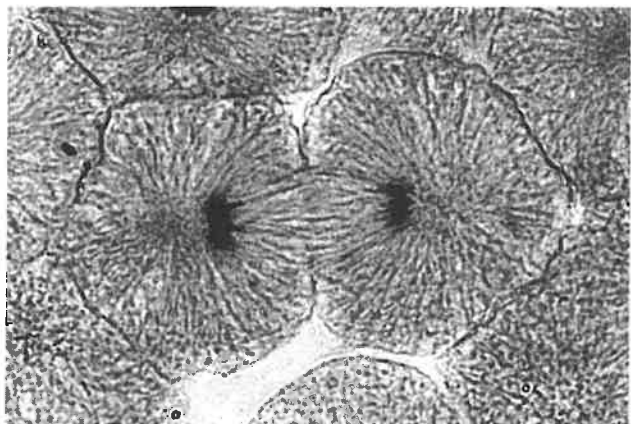
(b)



(c)



(d)



(e)

- anaphase (AN-a-faze)
- interphase (IN-ter-faze)
- metaphase (MEH-ta-faze)
- prophase (PRO-faze)
- telophase and cytokinesis (TELL-o-faze and cyto-kih-NEE-sis)

a _____

b _____

c _____

d _____

e _____

FIGURE 4.3 Mitotic phases.

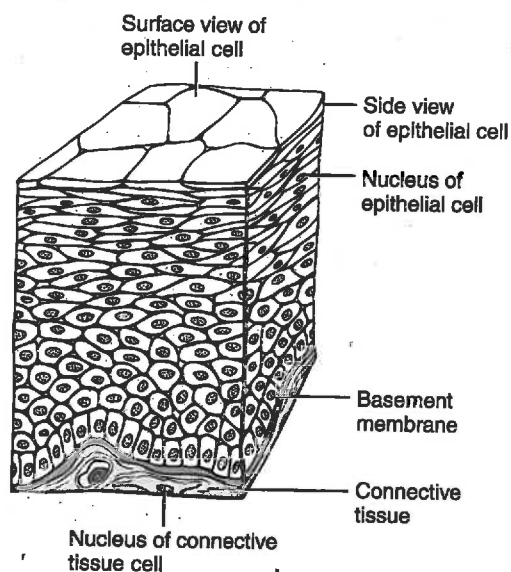


FIGURE 6.1 Epithelial tissue lining the mouth.

body surface such as the skin or lumen of a hollow organ. **Endocrine** (*endo-* = within) glands are ductless glands that produce and secrete hormones that diffuse into blood vessels.

Epithelial tissues exhibit **cellularity** (most of the tissue consists of cells and not extracellular material) and are supported by underlying connective tissue (Figure 6.1). Epithelial and connective tissues are separated by a **basement membrane**. Epithelial cells are packed together in an orderly fashion. Cell membranes of adjacent cells may be fused, forming tight junctions.

Covering and lining epithelium faces a space such as the **lumen** (*lumen* = light) of a blood vessel or intestine. The epithelial cell surface adjacent to the space is called the **apical** (*apex* = tip) **surface**, whereas the epithelial cell surface adjacent to the basement membrane is the **basal surface**. When viewed from the apical surface, one can observe how epithelial cells fit together like floor tiles to form a lining or barrier (Figure 6.1). When viewed in cross-section (side view of cells), one can observe differences in structure of the apical and basal surfaces. Apical surfaces of epithelial tissues may contain microvilli or cilia. Microvilli increase the surface area for absorption, while cilia move substances over the cell surface.

1. Epithelial Tissue Types

Epithelial tissue types are classified according to the number of epithelial cell layers (Figure 6.2) and the shape of the cell in the apical cell layer. If there is only one cell layer, the epithelium is **simple epithelium**; if there are two or more cell layers, the epithelium is **stratified epithelium**.

Epithelial cells have four shapes: squamous, cuboidal, columnar, and transitional. Cell shapes are best seen in side

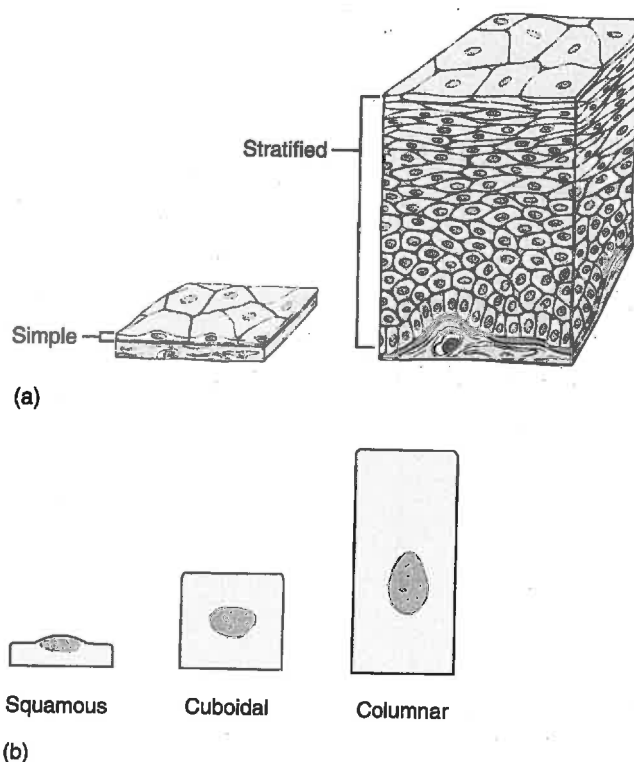
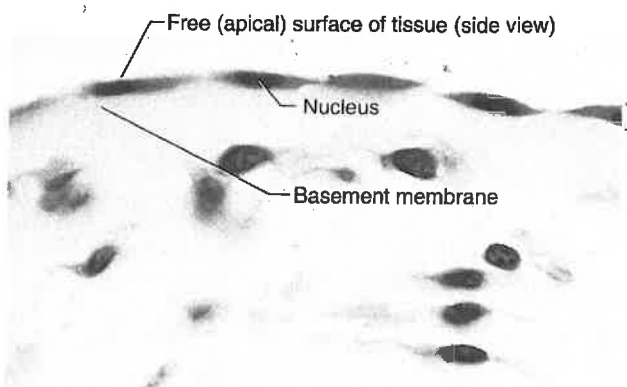


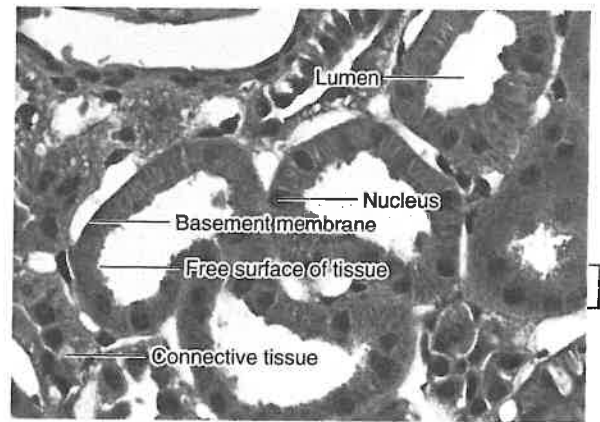
FIGURE 6.2 Epithelial tissue classification.

views of the cells (Figure 6.2). **Squamous cells** have a flattened nucleus and are the thinnest cells. **Cuboidal cells** are cube-like with a round nucleus in the center of the cell. **Columnar cells** are tall with an oval nucleus close to the base of the cell. **Transitional cells** change shape; they are rounder when the tissue is relaxed and flatten when the tissue is stretched.

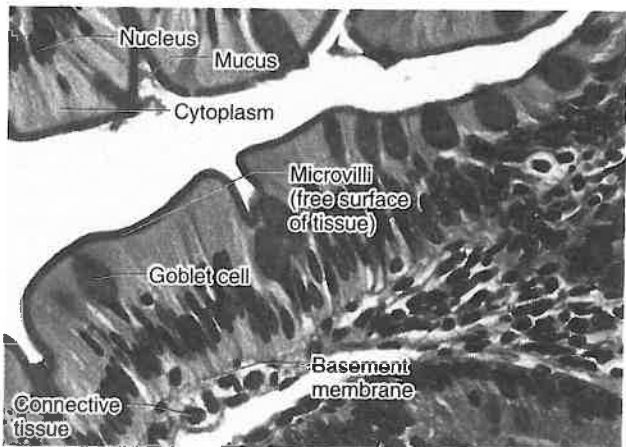
Simple epithelium provides a selective barrier allowing diffusion, filtration, secretion, or absorption of selected substances. There are three types of simple epithelium: simple squamous, simple cuboidal, and simple columnar. **Stratified epithelium** is thicker, is subject to wear and tear, and forms a protective barrier. Multiple cell layers make the tissue more resistant to damage, thereby preventing pathogens and foreign materials from crossing into underlying tissues. There are four types of stratified epithelium: stratified squamous, stratified cuboidal, stratified columnar, and transitional. Another type of epithelium is **pseudostratified** (*pseudo-* = false) **columnar epithelium**. This epithelium is only one cell layer thick because all the cells touch the basement membrane, although not all cells reach the apical surface. Therefore, there are cells of different shapes and heights, and their nuclei are at different levels. This gives the illusion of several different layers of cells. The tallest cells are narrow where they touch the basement membrane but have a columnar shape toward the outer surface, while the shorter cells do not reach the apical surface.



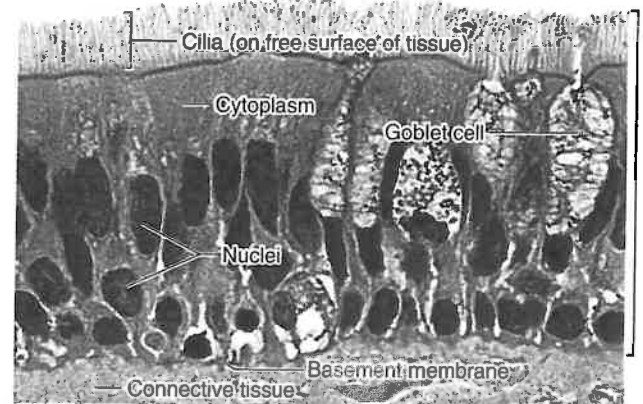
(a) Simple squamous epithelium (side view) (from lung)



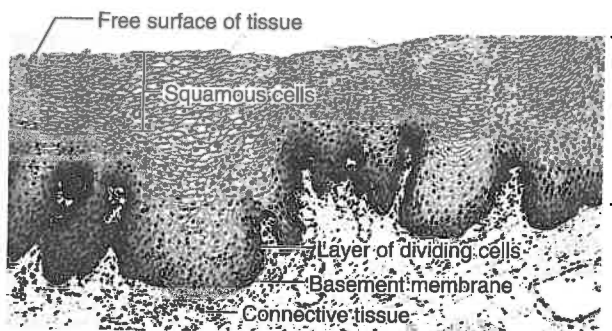
(b) Simple cuboidal epithelium (from kidney)



(c) Simple columnar epithelium (from intestine)



(d) Pseudostratified columnar epithelium with cilia (from trachea)

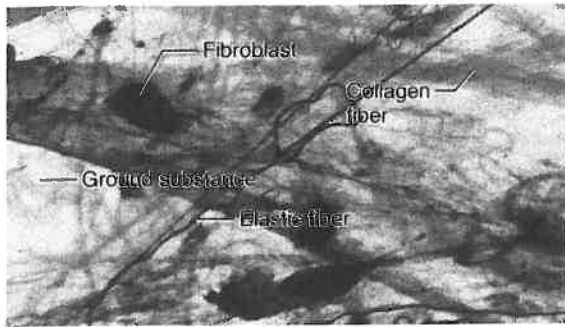


(e) Stratified squamous epithelium (nonkeratinized) (from esophagus)

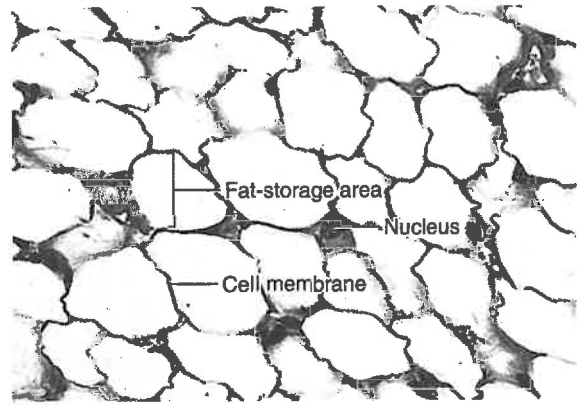


(f) Transitional epithelium (unstretched) (from urinary bladder)

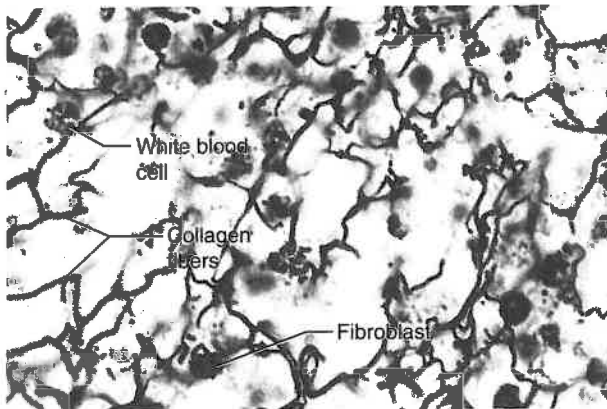
Figure 8.1 Micrographs of epithelial tissues. *Note:* The brackets to the right of each micrograph indicate the tissue.



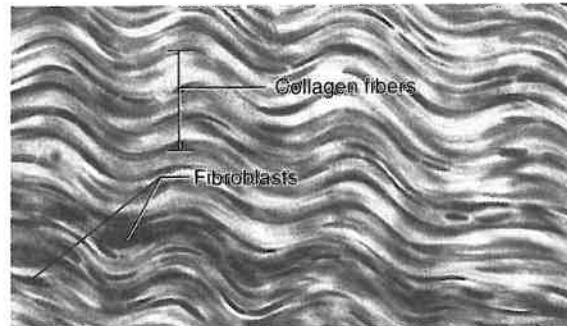
(a) Areolar tissue (from fascia between muscles)



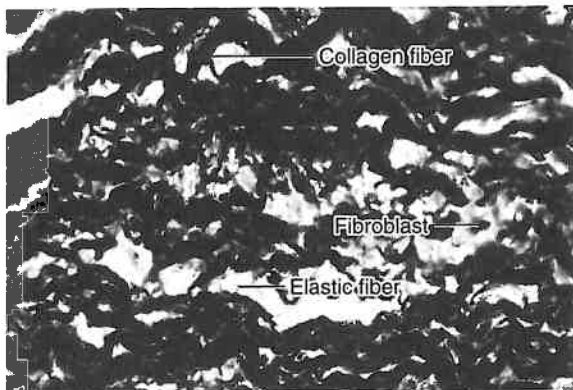
(b) Adipose tissue (from subcutaneous layer)



(c) Reticular connective tissue (from spleen)



(d) Dense regular connective tissue (from tendon)

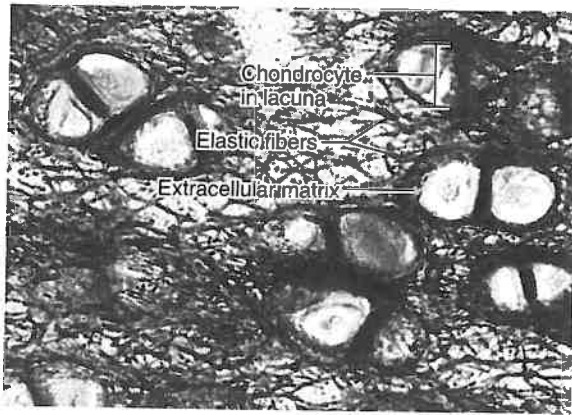


(e) Elastic connective tissue (from artery wall)

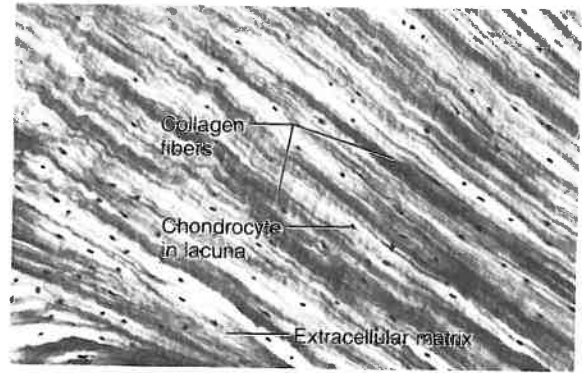


(f) Hyaline cartilage (from costal cartilage of ribs)

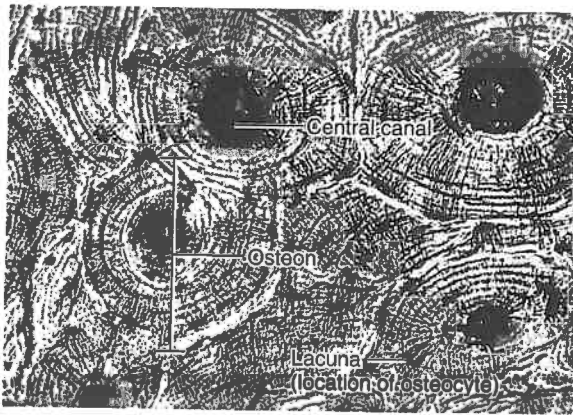
Figure 9.1 Micrographs of connective tissues.



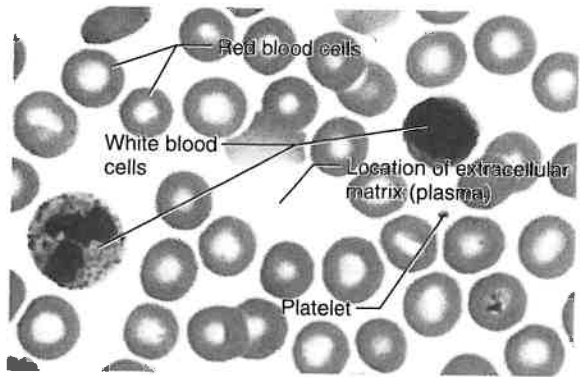
(g) Elastic cartilage (from ear)



(h) Fibrocartilage (from intervertebral discs)



(i) Compact bone (from skeleton)

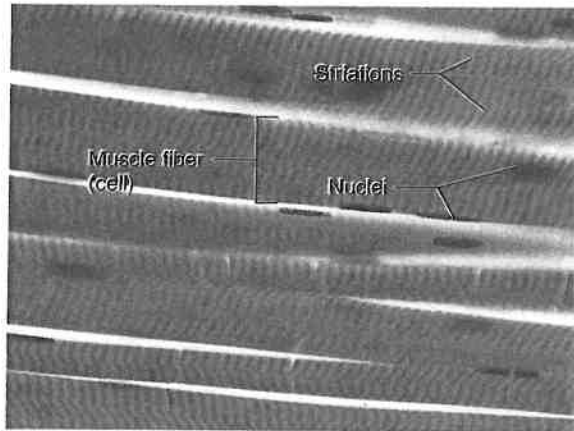


(j) Blood

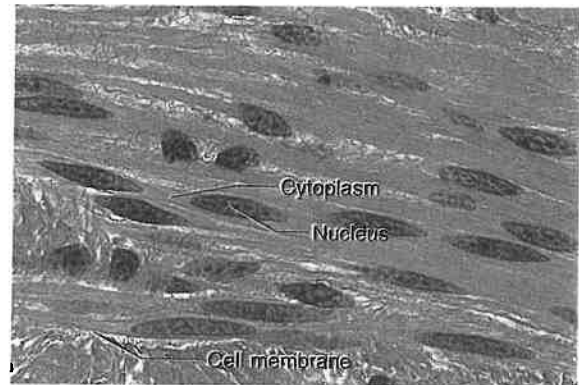
Figure 9.1 Continued.

4. Observe the prepared slide of nervous tissue and identify neurons (nerve cells), neuron cellular processes, and neuroglia. Compare your prepared slide of nervous tissue to the micrograph in figure 10.1. Prepare a labeled sketch of a representative portion of the tissue in Part B of the laboratory report.

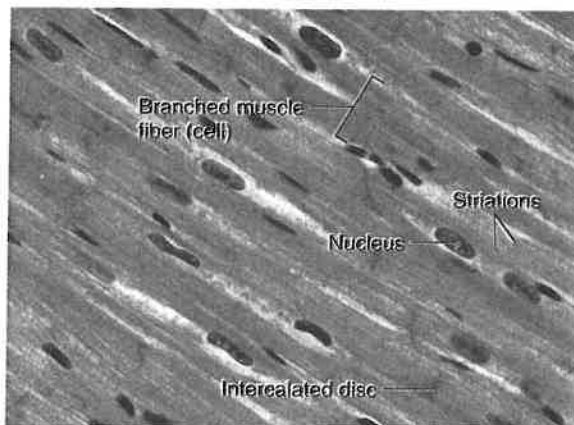
5. Complete Part B of the laboratory report.
6. Test your ability to recognize each of these muscle and nervous tissues by having your laboratory partner select a slide, cover its label, and focus the microscope on this tissue. Then see if you correctly identify the tissue. **A**



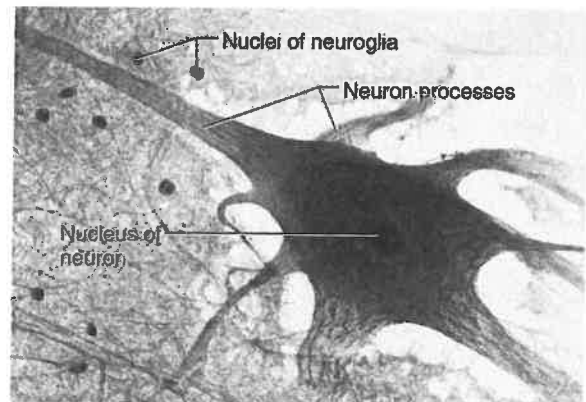
(a) Skeletal muscle



(b) Smooth muscle (from small intestine)



(c) Cardiac muscle (from heart)



(d) Nervous tissue

Figure 10.1 Micrographs of muscle and nervous tissues.

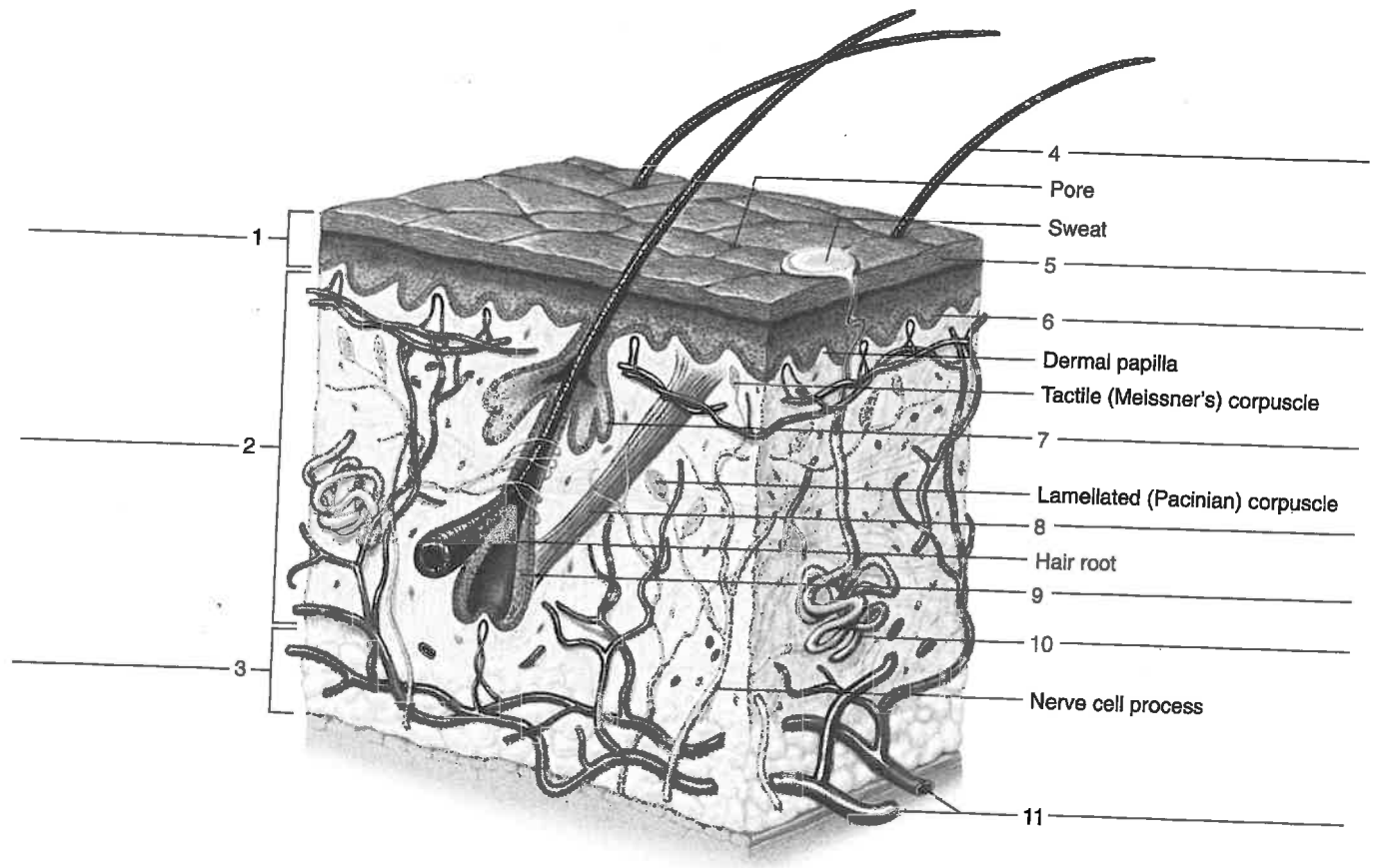


Figure 11.1 Label this vertical section of the skin and subcutaneous layer. 

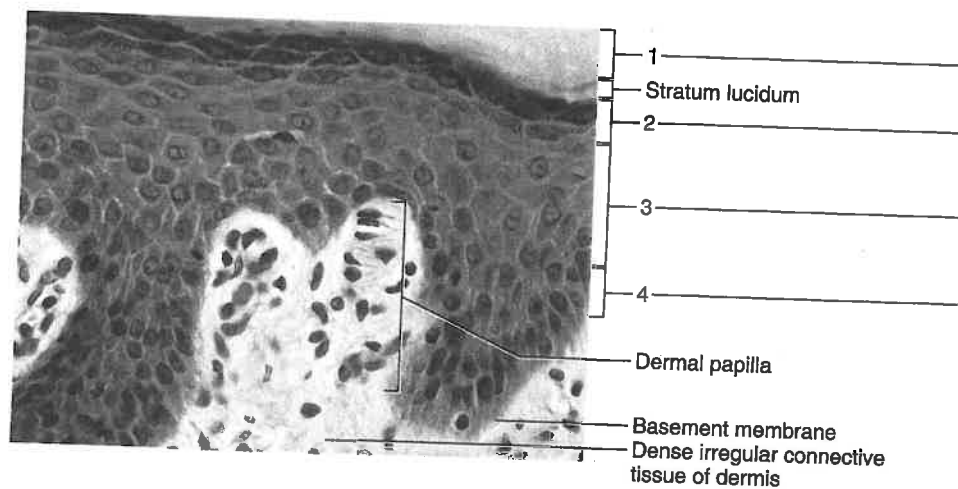



Figure 11.2 Label the epidermal layers in this section of thick skin from a fingertip (50 \times). 

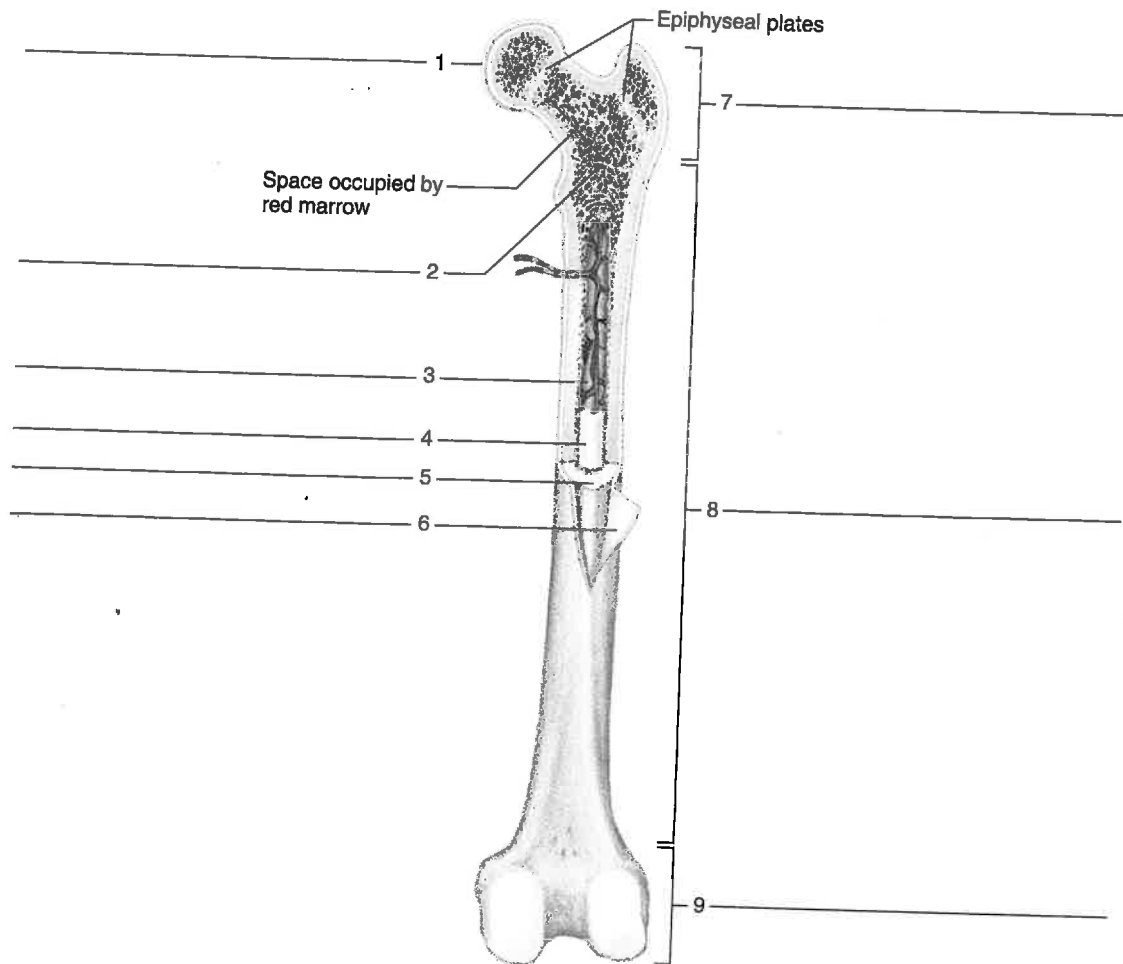
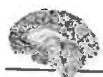


Figure 12.1 Label the major structures of this long bone (femur). **1 2**



Critical Thinking Application

Explain how bone cells embedded in a solid ground substance obtain nutrients and eliminate wastes.

4. Observe the individual bone specimens and arrange them into groups, according to the following shapes and examples: **A**

long—femur; humerus; phalanges

irregular—vertebrae

short—carpals; tarsals

sesamoid (round)—patella

flat—ribs; most cranial bones

5. Complete Part A of Laboratory Report 12.

6. Examine the sectioned long bones and locate the following:

epiphysis

proximal—nearest torso

distal—farthest from torso

epiphyseal plate—growth zone of hyaline cartilage

articular cartilage—on ends of epiphyses

diaphysis—shaft between epiphyses

periosteum—membrane around bone (except articular cartilage) of dense irregular connective tissue

compact bone—forms diaphysis and epiphyseal surfaces

spongy bone—within epiphyses

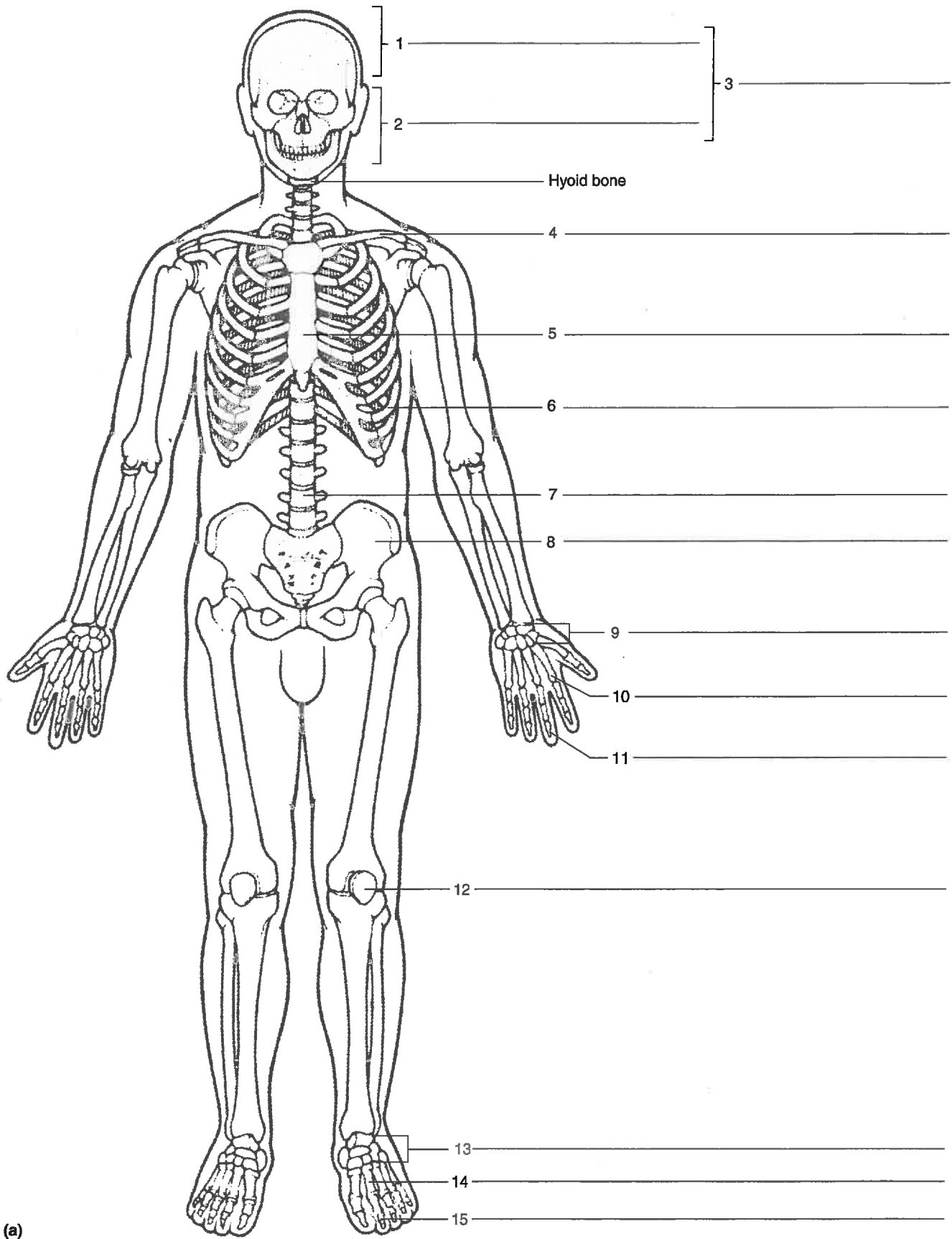
trabeculae—a structural lattice in spongy bone

medullary cavity—hollow chamber

endosteum—thin membrane lining medullary cavity of reticular connective tissue

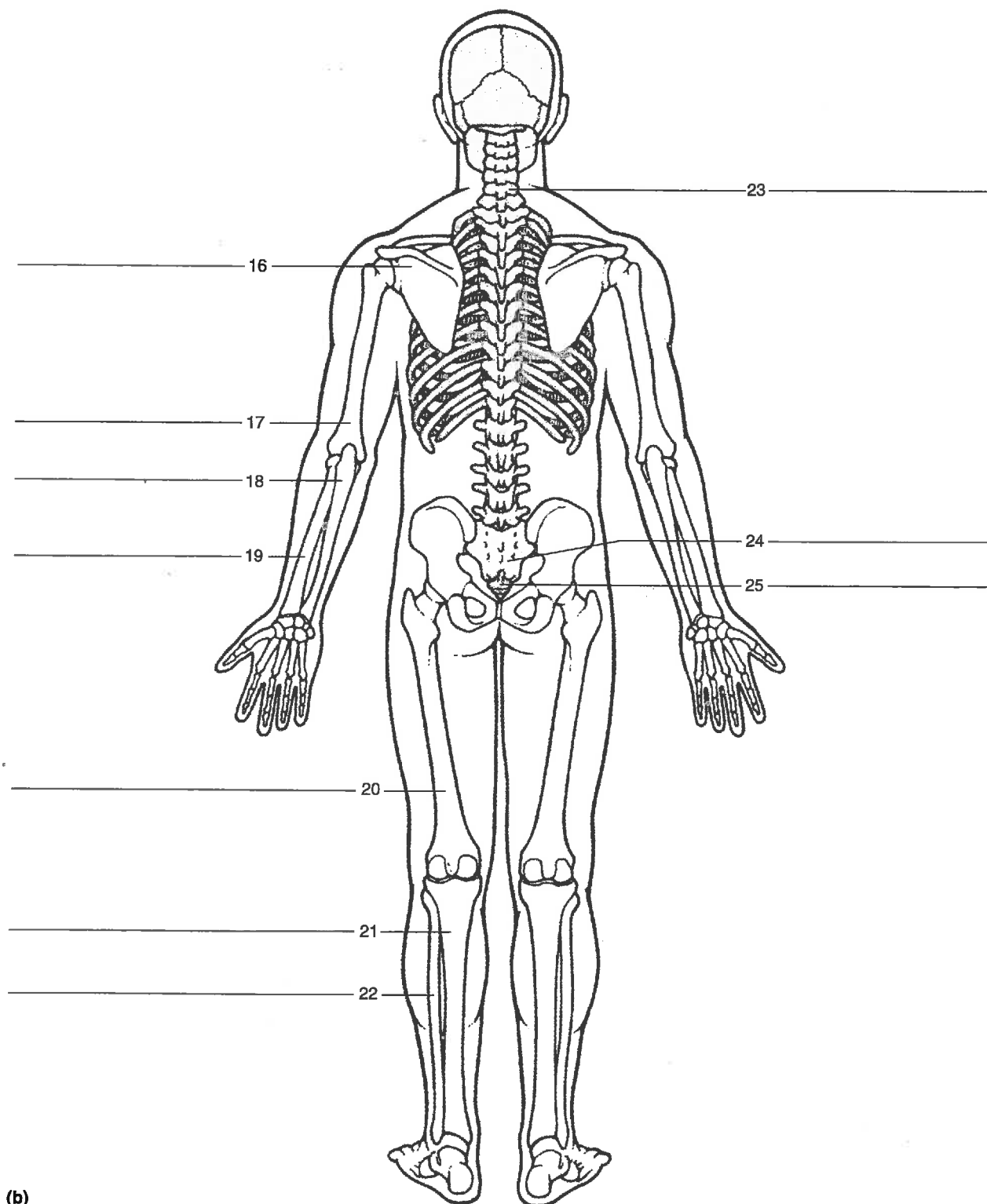
yellow marrow—occupies medullary cavity

red marrow—occupies spongy bone in some epiphyses and flat bones



(a)

Figure 13.1 Label the major bones of the skeleton: (a) anterior view; (b) posterior view. **1 2**



(b)

Figure 13.1 Continued.

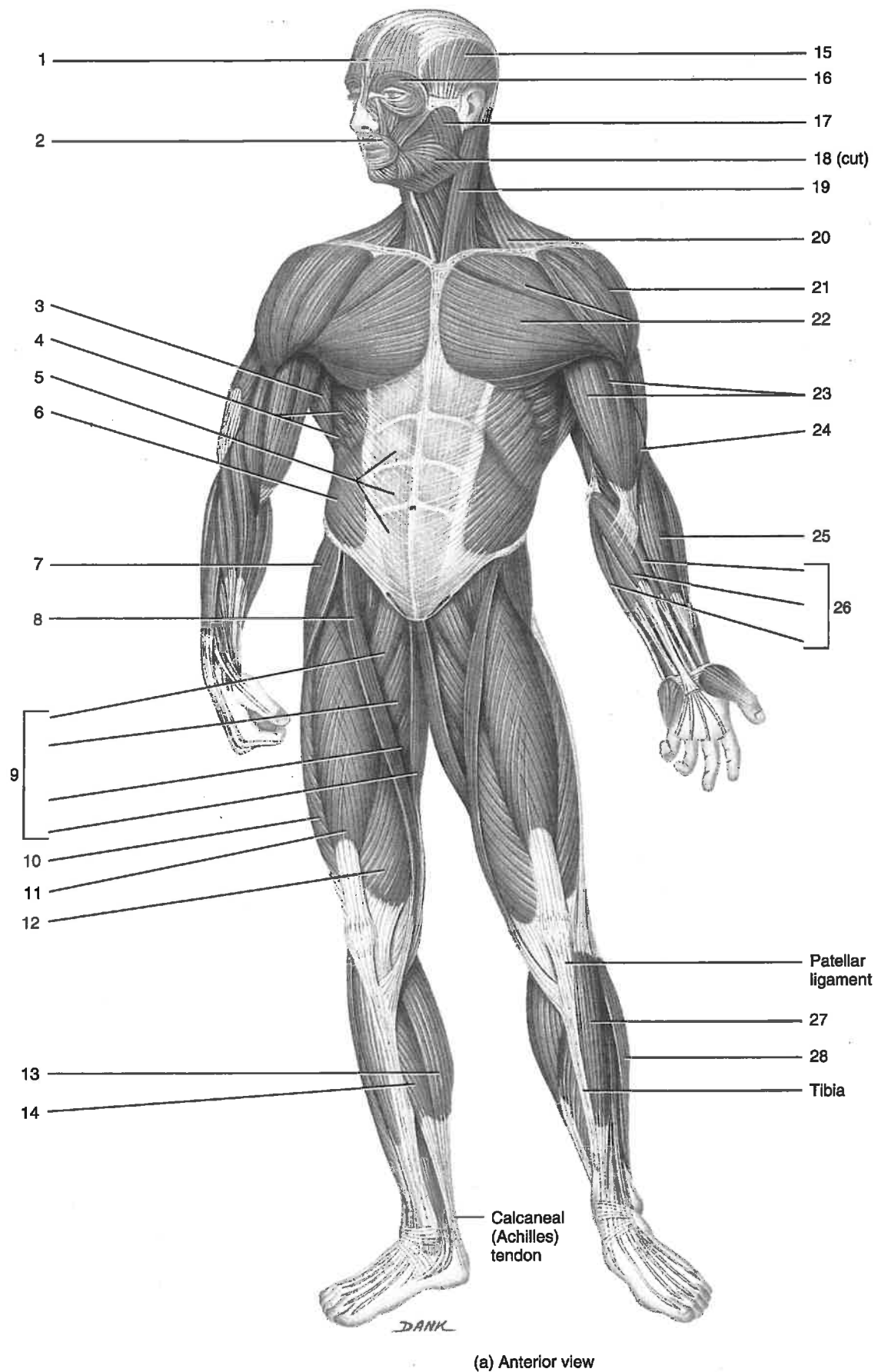
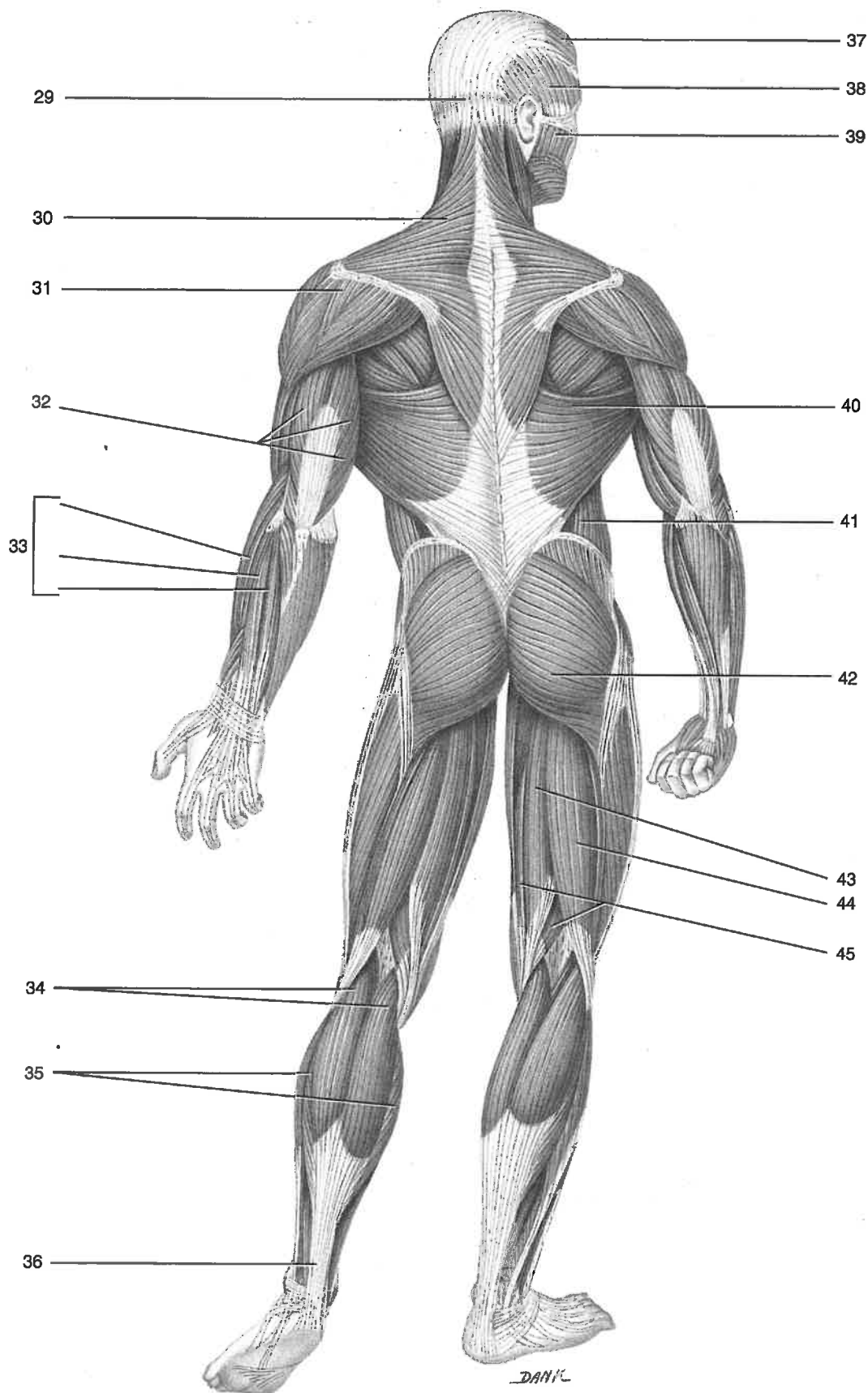


FIGURE 13.8 Superficial skeletal muscles.



(b) Posterior view

FIGURE 13.8 Superficial skeletal muscles, *continued*.

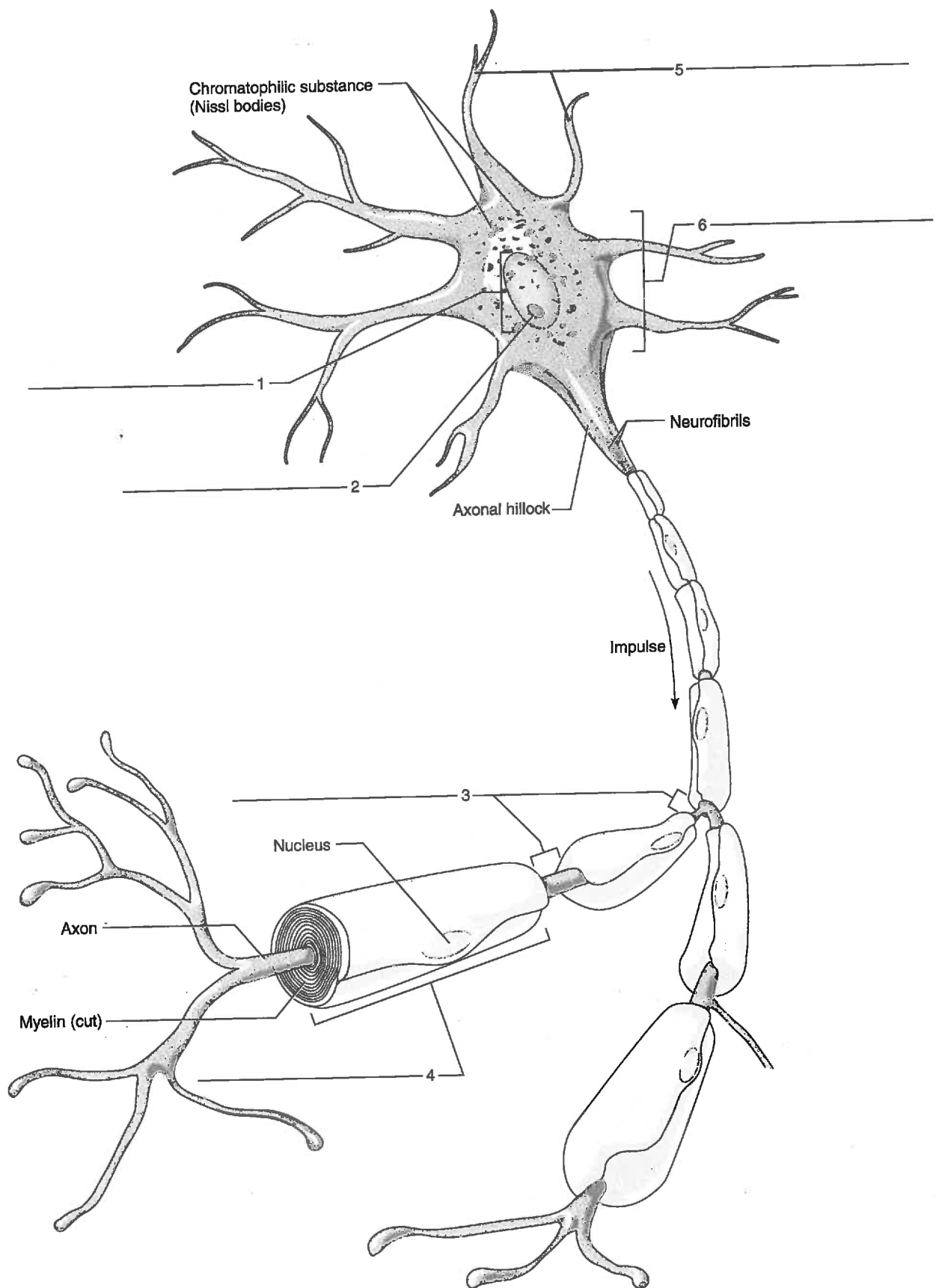


Figure 25.1 Label this diagram of a motor neuron. 