BODY TISSUES

17. Twelve tissue types are diagrammed in Figure 3–9. 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. Simple squamous epithelium
B. Simple cuboidal epithelium
C. Cardiac muscle
D. Dense fibrous connective tissue
E. Bone
F. Skeletal muscle

Figure 3–9, A–F
18. Describe briefly how the particular structure of a neuron relates to its function in the body. **Neuron has long cytoplasmic extensions that promote its ability to transmit impulses over long distances within the body.**
19. Using the 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

- **B. Epithelium**  
  1. Forms mucous, serous, and epidermal membranes
- **C. Muscle**  
  2. Allows for organ movements within the body
- **D. Nervous**  
  3. Transmits electrochemical impulses
- **A. Connective**  
  4. Supports body organs
- **B. Epithelium**  
  5. Cells of this tissue may absorb and/or secrete substances
- **D. Nervous**  
  6. Basis of the major controlling system of the body
- **C. Muscle**  
  7. The cells of this tissue shorten to exert force
- **B. Epithelium**  
  8. Forms hormones
- **A. Connective**  
  9. Packages and protects body organs
- **A. Connective**  
  10. Characterized by having large amounts of nonliving matrix
- **C. Muscle**  
  11. Allows you to smile, grasp, swim, ski, and shoot an arrow
- **A. Connective**  
  12. Most widely distributed tissue type in the body
- **D. Nervous**  
  13. Forms the brain and spinal cord

20. Using the 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)  
B. Simple columnar  
C. Simple cuboidal  
D. Simple squamous  
E. Stratified squamous  
F. Transitional

- **E. Stratified Squamous**  
  1. Lines the esophagus and forms the skin epidermis
- **B. Simple Columnar**  
  2. Forms the lining of the stomach and small intestine
- **E. Stratified Squamous**  
  3. Best suited for areas subjected to friction
- **A. Pseudostratified Columnar (ciliated)**  
  4. Lines much of the respiratory tract
- **A. Pseudostratified Columnar (ciliated)**  
  5. Propels substances (e.g., mucus) across its surface
- **F. Transitional**  
  6. Found in the bladder lining; peculiar cells that slide over one another
- **D. Simple Squamous**  
  7. Forms thin serous membranes; a single layer of flattened cells
21. 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.

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

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

2. Cilia  Flagellum  Microvilli  [Microvilli]
4. Adipose  Hyaline  Osseous  [Osseous]
5. Blood  Smooth  Cardiac  Skeletal  [Skeletal]
23. Using the 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**

24. 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.

- **Inflammation**
  1. The nonspecific response of the body to injury is called **regeneration**.

- **Clotting Proteins (Platelets)**
  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.
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.

<table>
<thead>
<tr>
<th>Membrane</th>
<th>Tissue type (epithelial/connective)</th>
<th>Common locations</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mucous</td>
<td>Epithelial</td>
<td>Cavities exposed</td>
<td>Moisten Surface</td>
</tr>
<tr>
<td>Serous</td>
<td>Epithelial</td>
<td>Cavities internal</td>
<td>Moisten Surface</td>
</tr>
<tr>
<td>Cutaneous</td>
<td>Epithelial</td>
<td>Skin</td>
<td>Protection</td>
</tr>
<tr>
<td>Synovial</td>
<td>Connective</td>
<td>Joints</td>
<td>Lubrication</td>
</tr>
</tbody>
</table>
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