Muscle Types Model Set

470029-438

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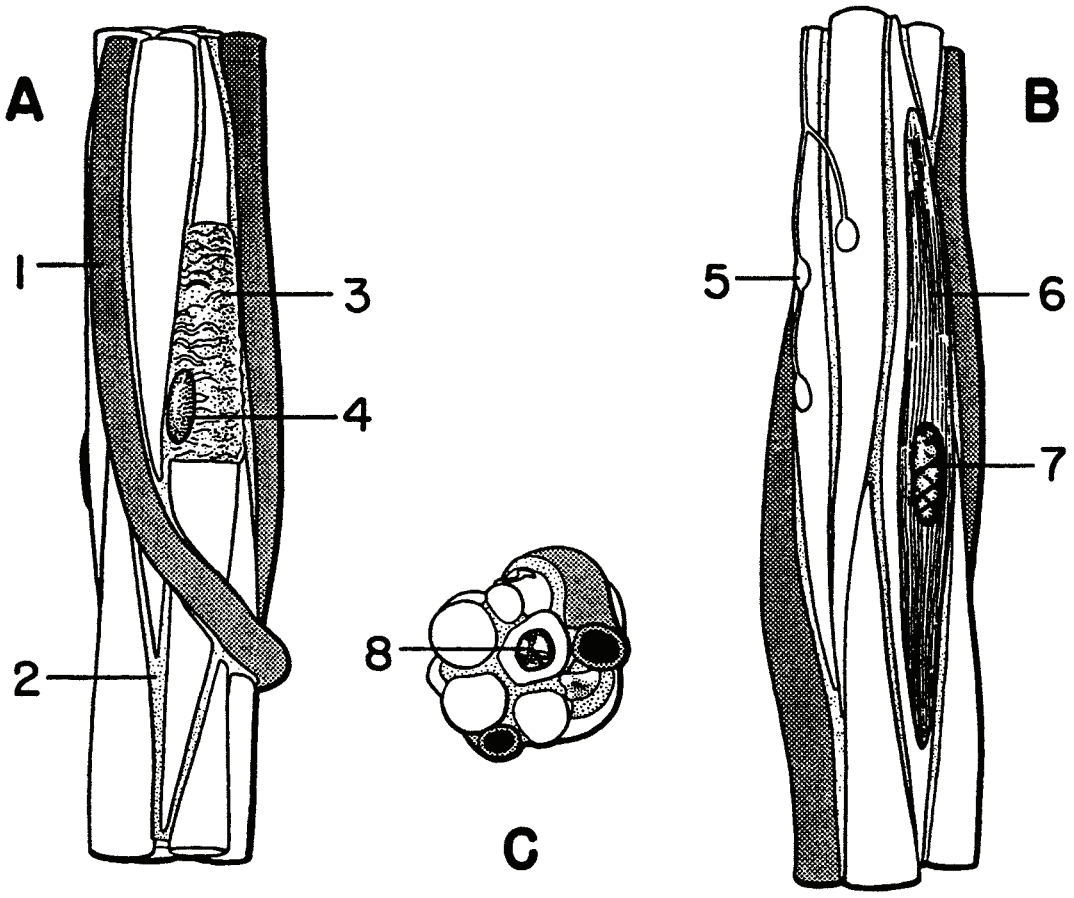
Smooth Muscle

(Approximate magnification 2500X)



A, B. Surface views of model from opposite sides, showing spindle-shaped smooth muscle cells separated by connective tissue. For structural reasons the relative length of the cells has been somewhat reduced in the model.

C. End view, showing cells in cross section.

1. Capillary. The blood supply of smooth muscle is scanty compared to that of skeletal and cardiac muscle. The prominence of the vessels on the model is due to the selection of a location near a capillary junction to show the manner of branching. The capillaries appear larger in this than in the other two models because of the difference in magnification.
2. Connective tissue, here seen between the muscle cells. This consists of elastic and reticular fibers. Its quantity varies greatly in different organs.
3. Connective tissue, seen here partly ensheathing a cell. The connective tissue actually encloses all the muscle cells throughout their length, binding them into a tissue.
4. Nucleus of a connective tissue cell. In some layers of smooth muscle connective tissue cells are either lacking or difficult to demonstrate.
5. Motor end-plate of autonomic nerve fiber.
6. Smooth muscle cell, cut away longitudinally to show myofibrils. A sarcolemma is lacking.
7. Nucleus of a smooth muscle cell.
8. The same in transverse section.

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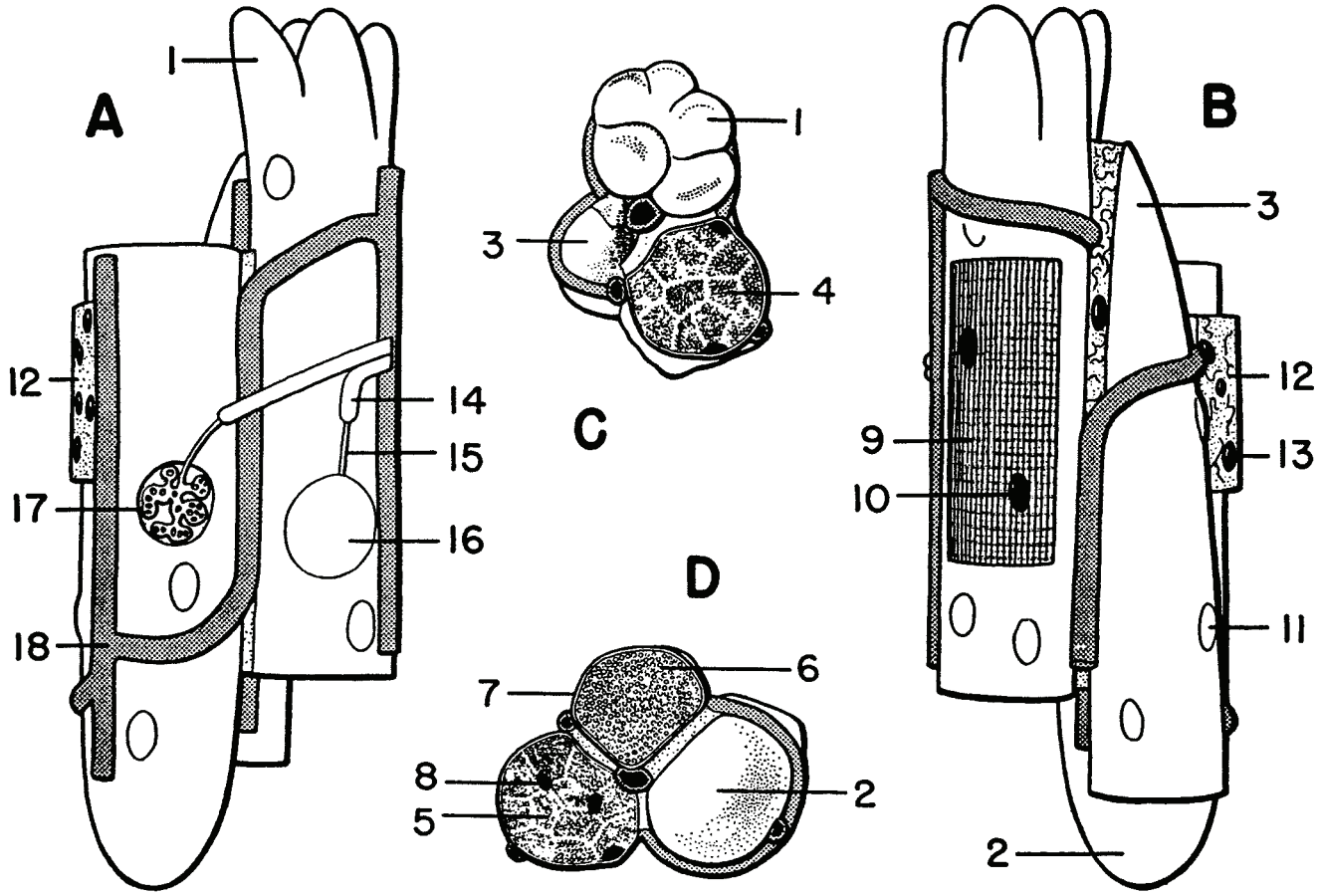
Skeletal Muscle

(Approximate magnification 1000X)



A, B. Model seen from opposite sides. Portions of three fibers are represented, showing different types of endings. On this scale of magnification an entire fiber would be several meters long.

C, D. Upper and lower ends of model. Cross-sections of fibers show three different arrangements of the structural elements.

1. Notched ending of the type commonly arising from periosteum.
2. Rounded ending of the type usually seen in union with a tendon.
3. Tapered ending, characteristic of terminations within the body of the muscle.
4. Cross-section of a fiber, showing peripheral nuclei and myofibrils grouped in Cohnheim's fields.
5. Cross-section of fiber with peripheral and central nuclei and myofibrils arranged in Cohnheim's fields.
6. Cross-section of fiber showing myofibrils uniformly distributed throughout sarcoplasm.
7. Sarcolemma.
8. Central nucleus.
9. Sarcolemma removed to show the myofibrils.
10. Peripheral nucleus.
11. Peripheral nucleus underlying sarcolemma.
12. Connective tissue (endomysium). This ensheaths all fibers of the muscle and serves as a pathway for nerves and blood vessels.
13. Nucleus of a connective tissue cell.
14. Myelinated nerve fiber.
15. Non-myelinated nerve fiber.
16. Motor end-plate underlying sarcolemma (hill of Doyere).
17. Sarcolemma and sarcoplasm removed to expose motor end-plate.
18. Capillary net. Skeletal muscle is highly vascular.

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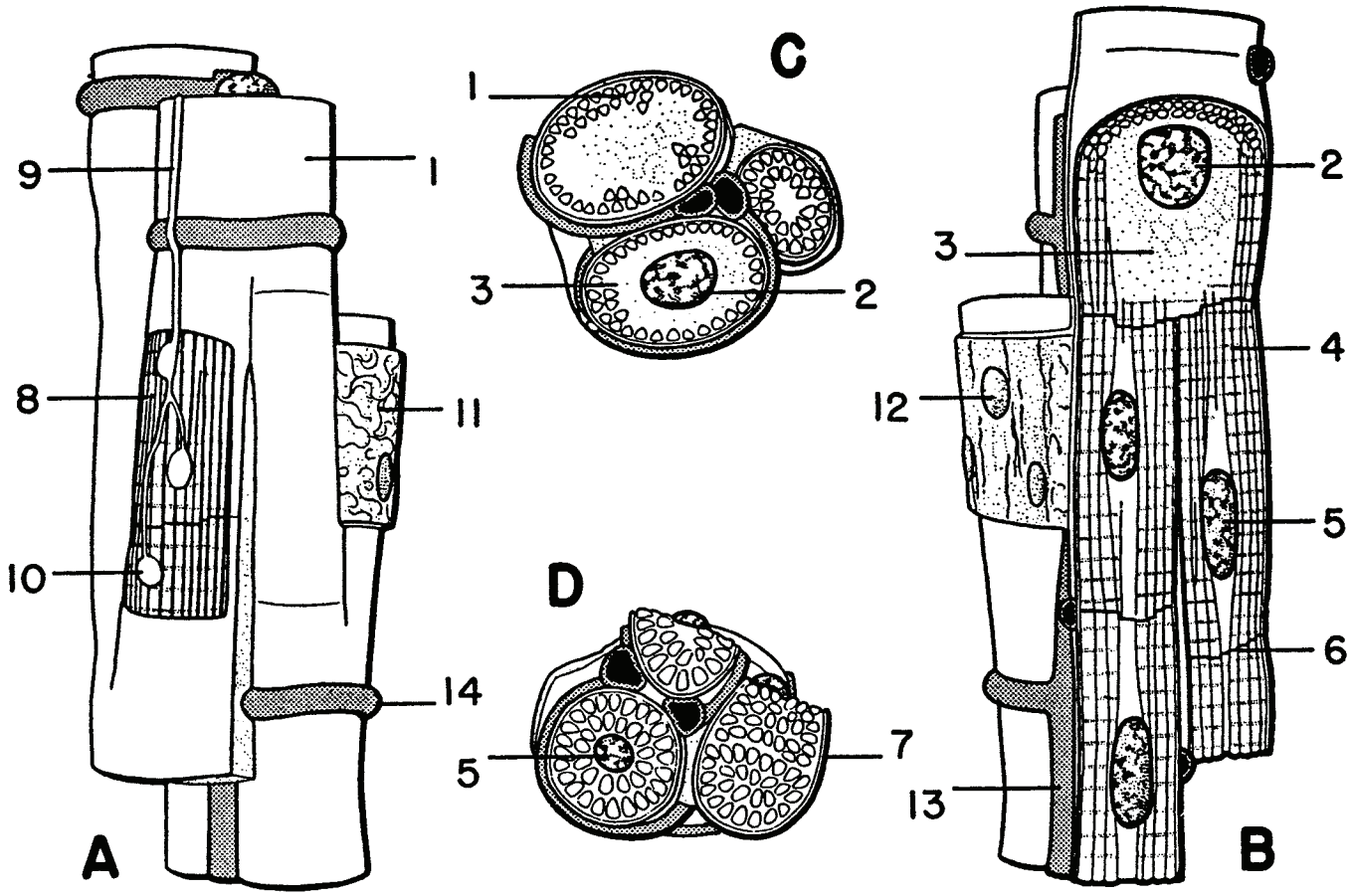
Cardiac Muscle

(Approximate magnification 1500X)



A, B. Surface views of model from opposite sides, showing syncytial arrangement of fibers. Sarcolemma partly removed in A. Purkinje cell and three heart muscle cells cut away to level of nuclei in B.

C. View of model from upper end, showing cross section of two Purkinje cells and one heart muscle cell.

D. Lower end of model, showing cross sections of three heart muscle cells, one passing through nucleus.

1. Purkinje cell, showing superficial arrangement of fibrils in B and C.
2. Nucleus of Purkinje cell.
3. Sarcoplasm (abundant in Purkinje cells, scant in heart muscle cells).
4. Myofibrils (evenly distributed in heart muscle cells, peripheral in Purkinje cells).
5. Nucleus of heart muscle cell.
6. Intercalated disks.
7. Sarcolemma.
8. Area of heart muscle cell with sarcolemma removed to show myofibrils.
9. Sympathetic nerve fiber.
10. Nerve ending on myofibrils.
11. Connective tissue, envelops all fibers and serves as a matrix for the nerves and blood vessels.
12. Nucleus of a connective tissue cell.
13. Longitudinal vessel of capillary network.
14. Capillary loop.

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