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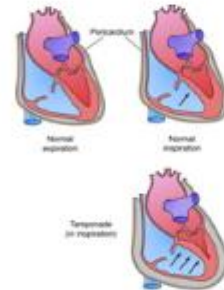
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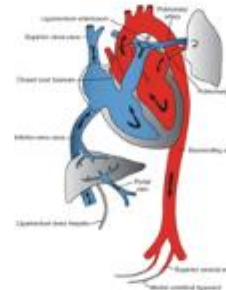
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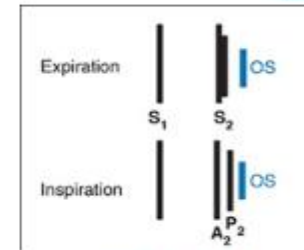
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Skeletal Muscle

A skeletal muscle cell is a multinucleated syncytium.

In skeletal muscle, each muscle cell, more commonly called a **muscle fiber**, is actually a multinucleated **syncytium**. A muscle fiber is formed during development by the fusion of small, individual muscle cells called **myoblasts** (see page 326). When viewed in cross section, the mature multinucleated muscle fiber reveals a polygonal shape with a diameter of 10 to 100 μm (Plate 21). Their length varies from almost a meter, as in the sartorius muscle of the lower limb, to as little as a few millimeters, as in the strapedius muscle of the middle ear. (Note: A muscle fiber should not be confused with a connective tissue fiber; muscle fibers are skeletal muscle cells, whereas connective tissue fibers are extracellular products of connective tissue cells.)

The nuclei of a skeletal muscle fiber are located in the cytoplasm immediately beneath the plasma membrane, also called **sarcolemma**. In the past, the term **sarcolemma** was used to describe a thick "membrane" that was thought to be the cytoplasmic boundary of the muscle cell. It is now known that the thick sarcolemma actually represents the plasma membrane of the cell, the external lamina, and the surrounding reticular lamina.

A skeletal muscle consists of striated muscle fibers held together by connective tissue.

The connective tissue that surrounds both individual muscle fibers and bundles of muscle fibers is essential for force transduction (Fig. 11.2). At the end of the muscle, the connective tissue continues as a tendon or some other arrangement of collagen fibers that attaches the muscle, usually to bone. A rich supply of blood vessels and nerves travels in the connective tissue.

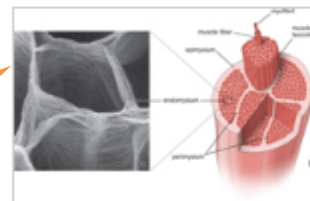


Figure 11.2. General organization of skeletal muscle.

a. This freeze fracture scanning electron micrograph of an intramuscular connective tissue was obtained from the bovine semitendinosus muscle. The specimen was routinely fixed for SEM and subsequently treated according to the cell maceration method with sodium hydroxide to remove muscle cells. Note a delicate honeycomb structure of the endomysium surrounding individual muscle cells. $\times 480$. **b.** This schematic diagram shows the general organization of skeletal muscle and its relation to the surrounding connective tissue. Note the organization of the endomysium that surrounds individual muscle cells (fibers), the perimysium that surrounds a muscle bundle, and the epimysium that surrounds the entire muscle.

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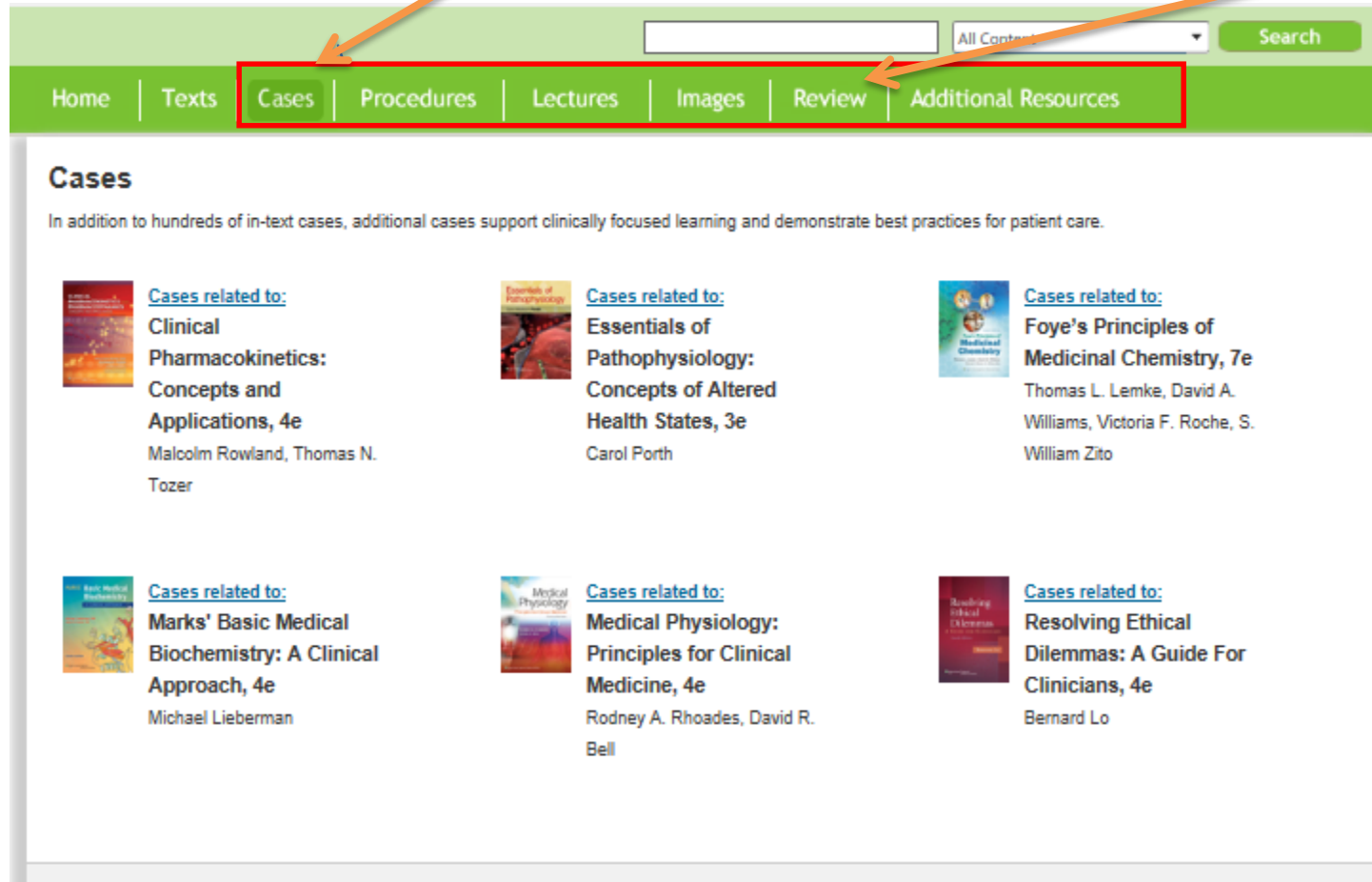
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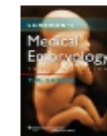
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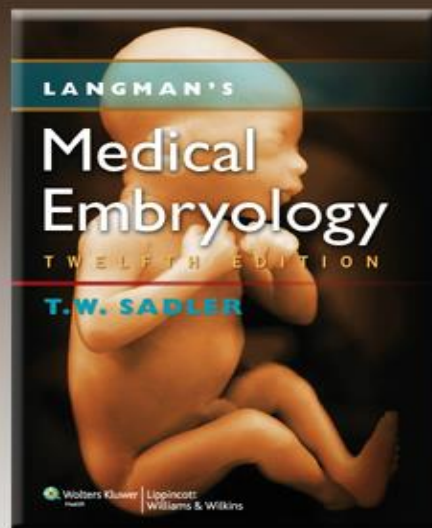
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