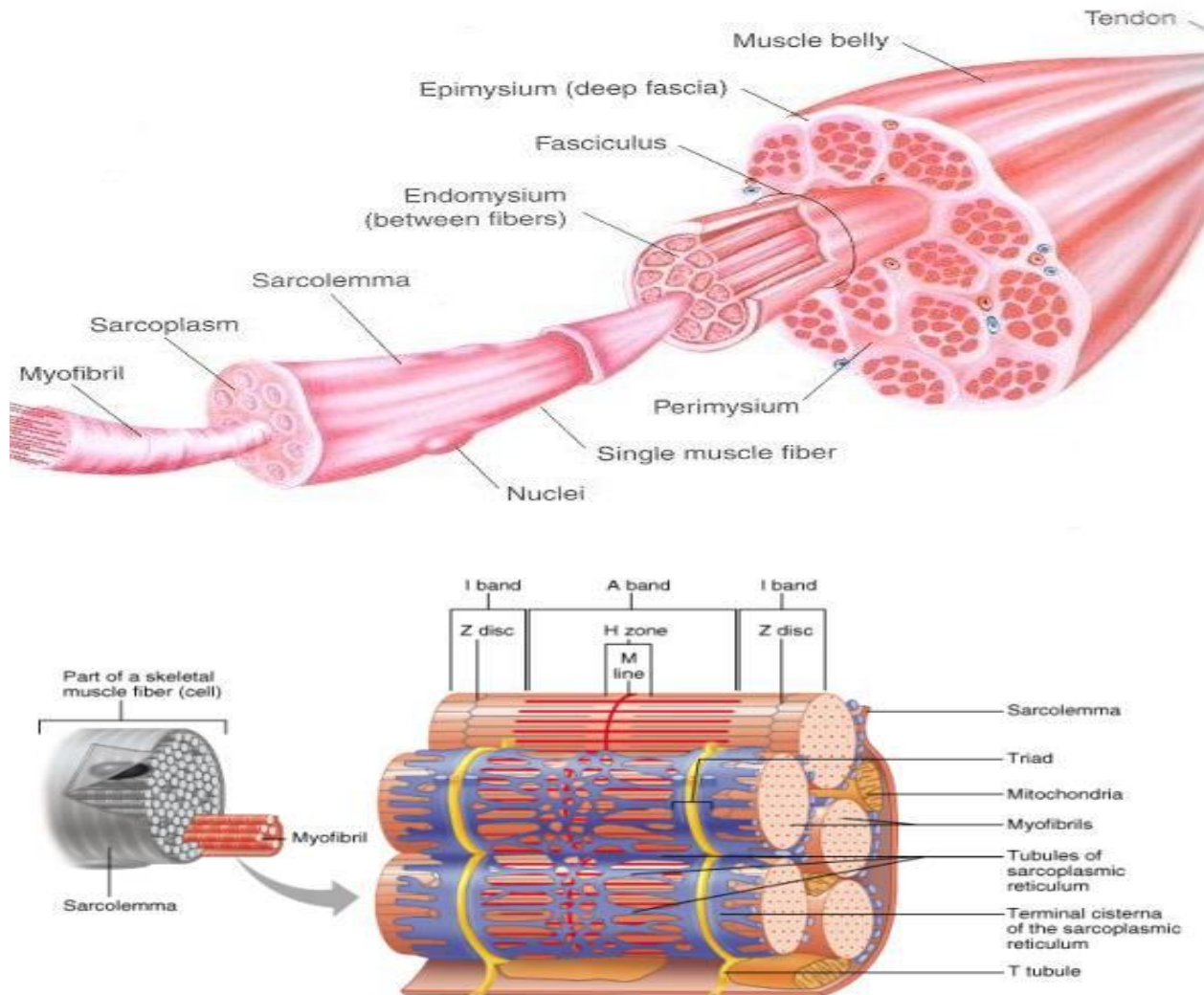


Anatomy

Muscle Anatomy

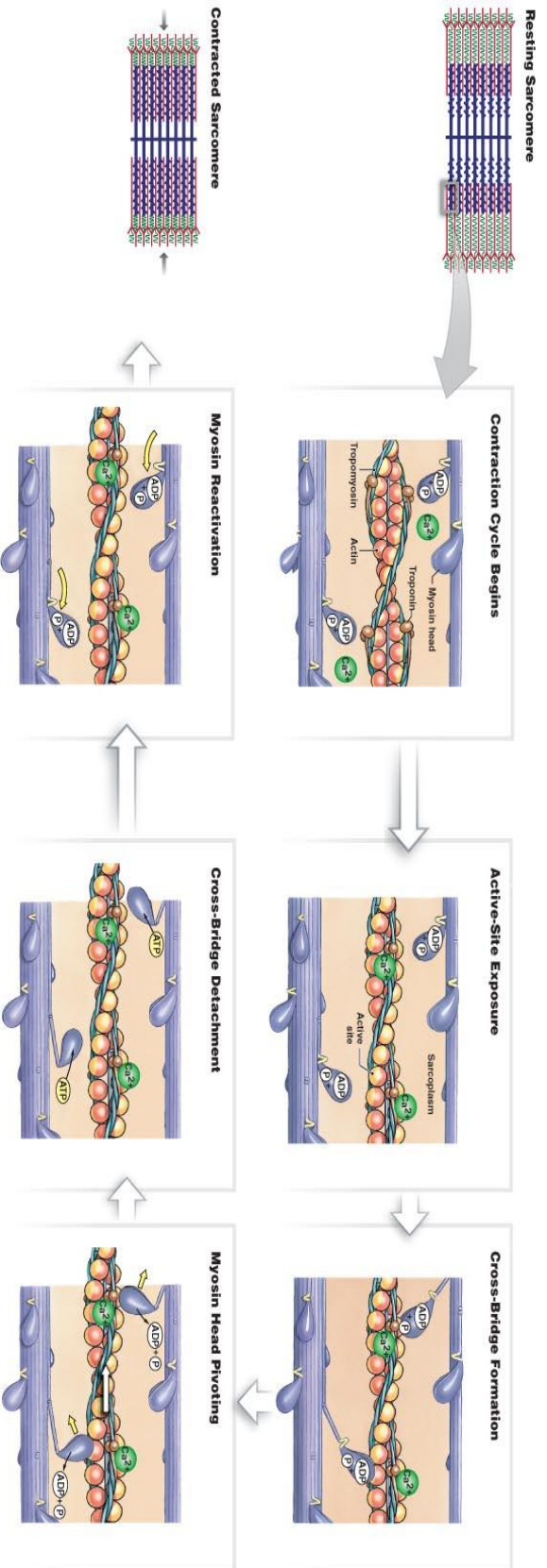


Parts of a Muscle

A Muscle is made up of several parts.

The very outermost layer of a muscle is the Epimysium. It surrounds the whole muscle and keeps all the muscle fibers (cells) together. The Perimysium holds several muscle fibers together within the muscle. The Endomysium wraps around individual muscle fibers on top of the sarcolemma (modified cell membrane). A single muscle fiber (muscle cell) is made up of many myofibrils wrapped in sarcoplasm (cytoplasm of muscle cell), and each muscle cell is multinucleate. Each myofibril is made up of tiny sarcomeres, which are the contractile units of a muscle. Myofibrils are also enveloped in sarcoplasmic reticulum (modified smooth ER) in order to facilitate muscle contraction. T-tubules cross the sarcoplasmic reticulum to deliver action potentials through the muscle cell. Fun fact: Your body can add and remove sarcomeres to make a muscle longer or shorter.

Anatomy



How a Muscle Works

When a muscle receives an action potential (Acetylcholine) via neuromuscular junction, the action potential flows through the t-tubules across the sarcoplasmic reticulum. This triggers a release of Ca^{2+} onto the actin complex. The actin complex, which is made of actin, which wants to bind myosin, and troponin, which wants to bind to Ca^{2+} . The troponin will bind with Ca^{2+} which turns the actin complex to allow action to bind to a myosin with an ADP bound to it. The myosin head swings, releasing its bound ADP and sliding the acting complex down. This is the actual contraction of the muscle. In order for the myosin to detach from the actin, an ATP must bind to it. The ATP is converted to ADP and the energy release allows the myosin to reset itself and detach. The Ca^{2+} is removed along with the Acetylcholine so that the process can be repeated.