

Smooth Muscle

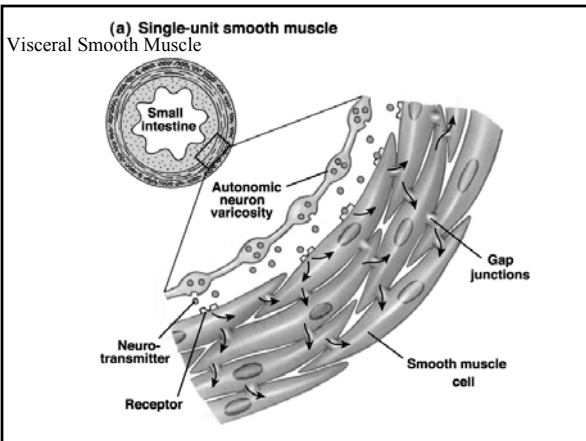
Unstriated muscle associated with visera.

(Compare to skeletal muscle)

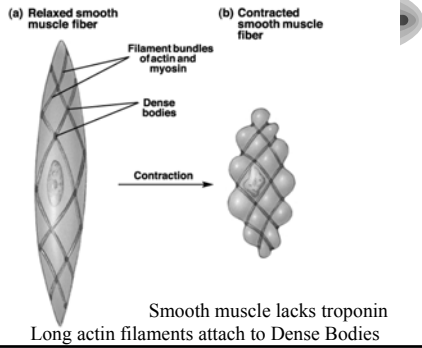
- Controlled by autonomic nervous system, hormones and paracrines.
- actin/myosin structure allows sustained contraction in different directions
- role of calcium in contraction

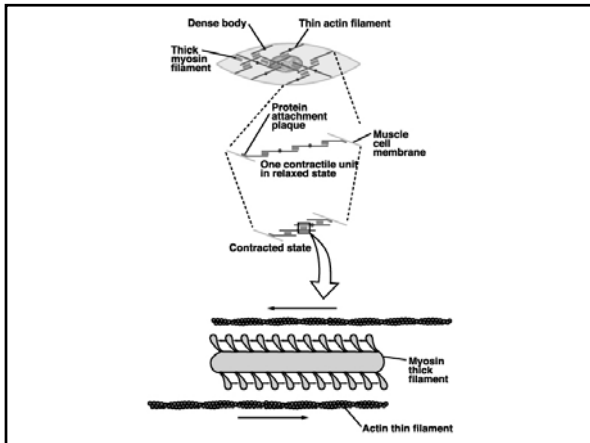
Smooth Muscle

- Found in walls of hollow organs and tubes, where its contraction will change the shape of an organ
- Generates force to move material through the lumen of an organ
- Smooth muscle is controlled by hormones and paracrines, as well as autonomic nervous system neurotransmitters



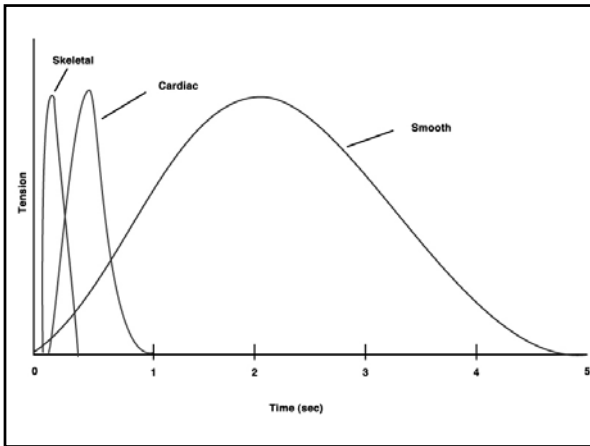
Contractile fibers are arranged in oblique bundles rather than in parallel sarcomeres





Smooth Muscle:

- Slower in developing tension
- Sustain contractions for extended periods without fatigue
- Allows the walls of organs to maintain tension with a continued load



Myosin of Smooth Muscle

- Different isoform than that found in skeletal muscle
- Smooth muscle myosin ATPase activity is much slower, contraction is longer
- Myosin light chain in the myosin head regulates contraction and relaxation

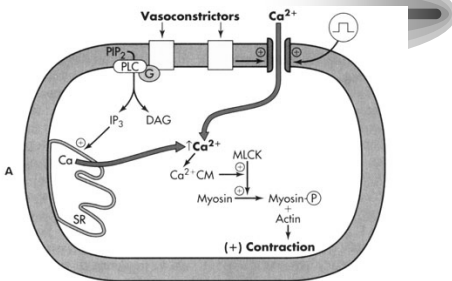
Anatomy (cont.)

- Relatively little sarcoplasmic reticulum
- Lacks T-tubules
- Chemically linked to the cell membrane, rather than mechanically linked
- Ca^{+2} storage is supplemented by caveolae, small vesicles that cluster close to the cell membrane. Voltage/ligand gated Ca^{+2} channels

Response of Smooth Muscle to Stimuli

- Neurotransmitters and hormones acting on smooth muscle can INHIBIT contraction as well as stimulated it.
- Ca^{+2} influx through sarcolemma voltage gated Ca^{+2} channels is the signal for SR Ca^{+2} release
- Ca^{+2} storage is supplemented by caveolae , small vesicles that cluster close to the cell membrane.

Smooth muscle contraction



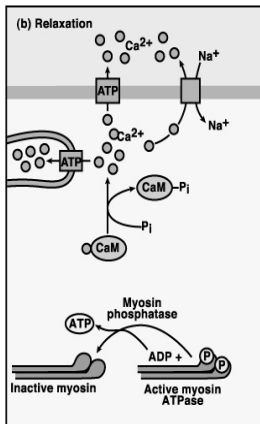
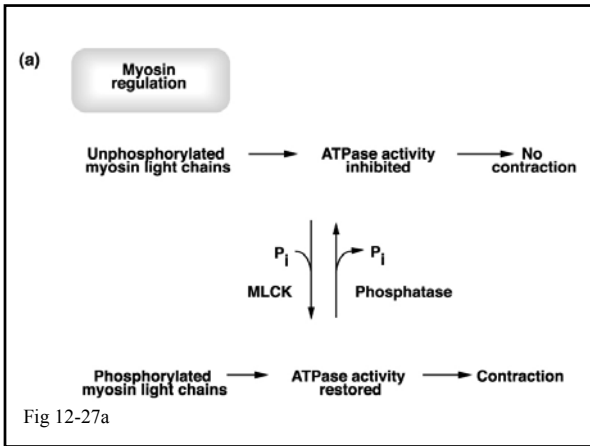
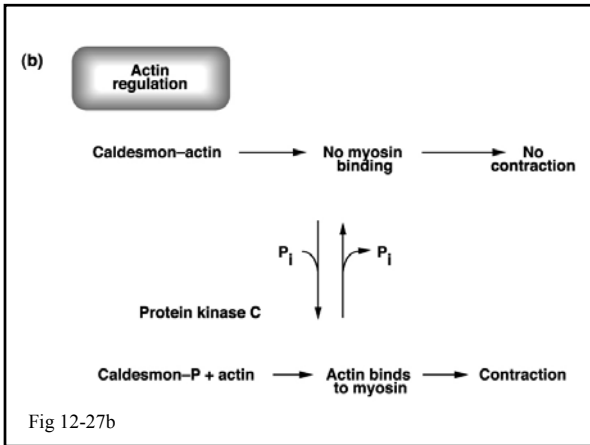
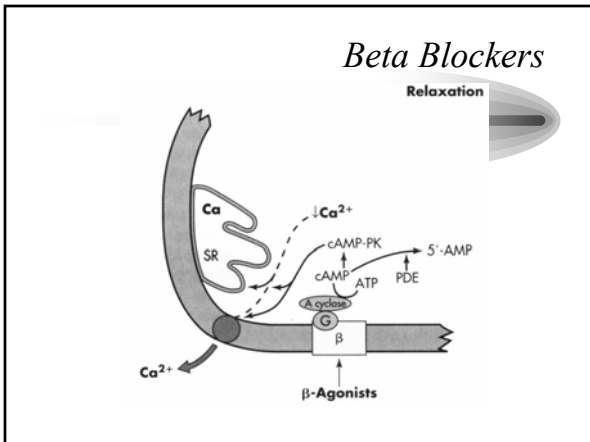


Fig 12-26b







Calcium channel blockers

