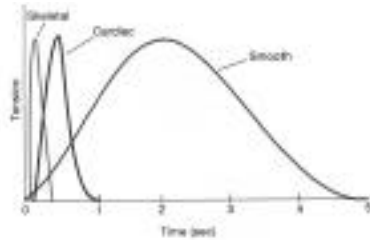


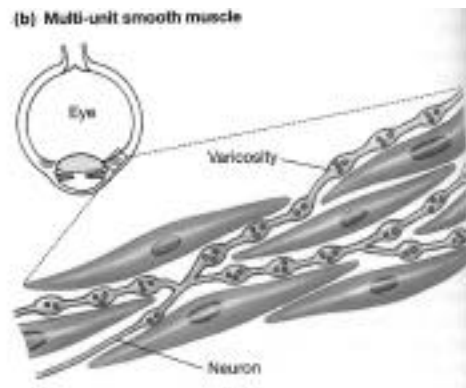
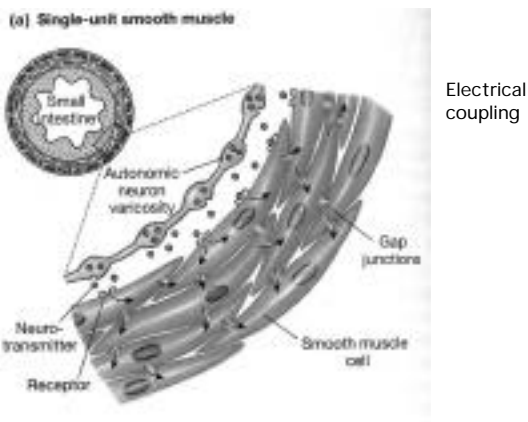
## Skeletal, cardiac and smooth muscle

- How are these muscle types similar and dissimilar



## Smooth Muscle- Review

- Like skeletal: basic molecules
- Differ: size, time course, excitation contraction coupling
- No rigid sarcomere, allows for much greater change in fiber length, while still maintaining ability to contract



## Smooth muscle tone

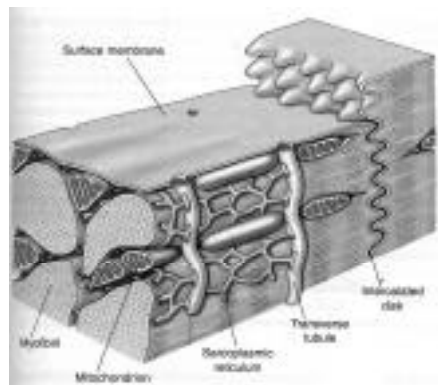
- Skeletal tone= asynchronous firing of motor units
- Smooth muscle tone = graded contraction depends on level of calcium and # of cross bridges formed

## Examples of tone in smooth muscle

- Basic electrical rhythm of small intestine
- What happens to tone when you add acetylcholine?
- What happens to tone when you add epinephrine?
- Why does tone change in just the opposite way in walls of arteriole?

## Cardiac muscle

- Structure:
  - sarcomeres (striated),
  - Troponin/tropomyosin
  - T-tubule
  - SR (not very elaborate) and significant calcium must come from extracellular fluid
  - Branching fibers, intercalated discs
    - desmosomes (why?)
    - Gap junctions (why?)

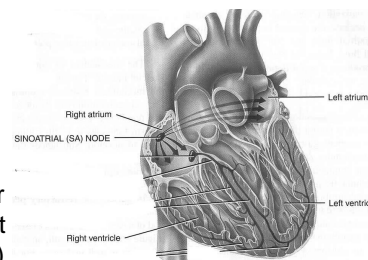


## Metabolism of cardiac muscle

- Oxidative or glycolytic?
- Would you expect high mitochondrial density?
- Would you expect high capillary density?

## Heart contracts as a unit

- 2 atria contract
- Then 2 ventricles contract
- Pacemaker cells (about 1% of total) drive this



## Myogenic heart

- Pacemaker potential - spontaneous depolarization
- What is effect of NE or Epi?
- What is effect of Ach?
- Action potential in most of heart cells
  - Long plateau phase due to calcium influx
  - Two roles for calcium
- What is significance of long action potential?

## How to increase cardiac strength of contraction

- Recruitment?
- Higher frequency of stimulation?
- More favorable overlap of thick and thin filaments due to stretch?
  - Starling Law of the Heart
- Increased sympathetic stimulation (increased calcium)
- Calcium channel blockers