

Review 15

Back to the heart and cardiac muscle

S.A. node spontaneously depolarizes because

- K^+ channel that allows loss of potassium from node cells gradually shuts down, resulting in depolarization of muscle fiber of node
- at critical level, action potential spreads out (wave of depolarization), triggering contraction of muscle fibers
- effect of norepinephrine: when bound to its binding protein, causes K^+ channel to shut down faster, increasing rate at which K^+ loss from cells decreases, causing cells to reach critical level of depolarization more rapidly and thereby causing more frequent depolarizations
- effect of acetylcholine: when bound to its binding protein, causes K^+ channel to shut down slower, decreasing rate at which K^+ loss from cells decreases, causing cells to reach critical level of depolarization less rapidly and thereby causing less frequent depolarizations

action potential in cardiac muscle lasts 250 ms (not 6 ms as in nerve)

- sets upper limit to rate of heartbeat
- makes EKG interpretation possible

Back to nerves

motor units and graded responses

sensory input to brain and sensations

- sensory neurons are specialized to respond to various environmental stimuli
- sensory information, *regardless of the nature of the stimulus*, is transmitted to the brain in the form of action potentials
- interpretation of these action potentials as sensations (vision, sound, etc.) occurs primarily in specialized regions of cerebral cortex
- switch nerves and get unusual results???

Review 15, con't

Reproduction

Asexual: Reproduction which does not involve the fusion of gametes.

e.g.: mitotic divisions; budding; fragmentation; spores

Sexual: Reproduction in which the fusion of gametes is the first step in the reproductive process.

NOTE: Many species which reproduce sexually also reproduce asexually!

Process includes

- *fusion of gametes, followed by*
- *multiple mitotic cell divisions, then*
- *cellular differentiation, and*
- *growth and maturation.*

