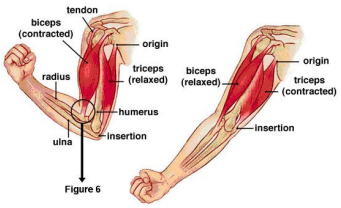
Unit 6b
Muscular System



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Muscle Actions and Comparisons

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8.4 Muscular Responses

B. All-or-None Response

1. Each individual muscle fiber either
2. There are never any
3. A contraction that requires more force uses

8.4 Muscular Responses

A. Threshold Stimulus

1. In order for a muscle fiber to
2. It will not contract until it

8.4 Muscular Responses

C. Recording a Muscle Contraction

1. Muscle contractions can be recorded and graphed -
2. When a single muscle is stimulated, it undergoes

8.4 Muscular Responses

a. This is called a
b. The time period between the stimulus and the twitch is called the

8.4 Muscular Responses

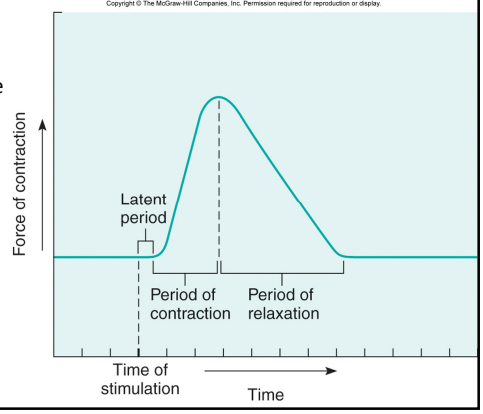
c. Muscle fibers are either

   i. Slow twitch cells are

   ii. Fast twitch cells are

8.4 Muscular Responses

A myogram of a single muscle twitch.



8.4 Muscular Responses

3. When multiple stimuli are received by the muscle, the muscle is

   a. This causes the forces of the individual contractions to be

8.4 Muscular Responses

4. If the multiple signals come too fast and there is not time for

   a. This is also known as
   b. This can be caused by

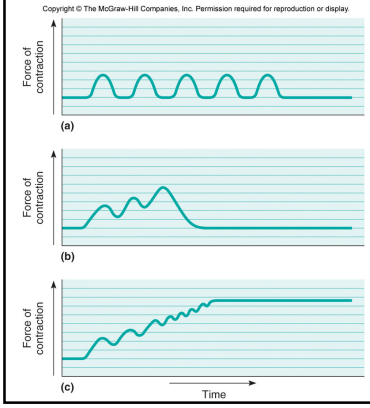
8.4 Muscular Responses

D. Recruitment of Motor Units

1. Because several individual muscle cells are controlled by a single motor neuron (a motor unit),

2. Each motor unit within a muscle has

8.4 Muscular Responses



Myograms of
a) a series of twitches,
b) summation, and
c) a tetanic contraction.

8.4 Muscular Responses

a. This allows the brain

   i. As a higher threshold

   ii. This is called

8.4 Muscular Responses

E. Sustained Contractions
   1. Individual
   2. More often, a muscle receives a

8.7 Skeletal Muscle Actions

A. Origin and Insertion
   1. All skeletal muscles are attached to
      a. One end is typically attached to an
         i. This is called the
      b. The other end of the muscle is typically attached to a.
         i. This is called the
   2. Some muscles, like the biceps brachii, have

8.4 Muscular Responses

4. Even while your body is at rest, some smaller muscle fibers are contracting in sustained contraction to help maintain your
   a. This is called

8.7 Skeletal Muscle Actions

B. Interaction of Skeletal Muscles
   1. Most skeletal muscles function in
      a. One muscle
      b. This is because muscles can only

8.7 Skeletal Muscle Actions

2. The muscle in the pair that provides the majority of the movement is called the
   a. Other muscles that aid in the movement are called
3. The opposite muscle or muscles to the prime mover and the synergists are called the
   a. These muscles provide the

8.5 Smooth Muscle

A. The contractile mechanism is essentially the same as

1. Smooth muscle are triggered to contract by both

Comparison of Muscle Types

So far, we have primarily talked about skeletal muscle.

This section will compare smooth and cardiac muscle to skeletal muscle.

8.5 Smooth Muscle

2. Many
3. Smooth muscle cells contract and relax more slowly, but can also sustain their contractions
4. Smooth muscles cells can

8.5 Smooth Muscle

B. The actin and myosin filaments in the myofibrils of smooth muscle are organized more
   1. This is why smooth muscle cells do not have

8.5 Smooth Muscle

2. smooth muscle.
   a. This type of smooth muscle is made up of
   b. Found lining the walls of (stomach, intestines, bladder, uterus, etc.)
   a. Visceral smooth muscle itself is exciting meaning that individual cells can
   b. It can also be

8.5 Smooth Muscle

C. There are two major types of smooth muscle.
   1. smooth muscle.
      a. The individual muscle cells are
      b. Found in the

8.6 Cardiac Muscle

A. Cardiac muscle is found only in the
B. The contraction mechanism is again, essentially the same as skeletal and smooth muscle.
   1. The way

8.6 Cardiac Muscle

C. Cardiac muscle cells connect to each other at structures called

D. Cardiac muscle cells are both