

MUSCULAR SYSTEM REVIEW

1. Identify the general functions of the muscular system
2. Define the four characteristics of muscular tissue
 - a. irritability (excitability) -
 - b. extensibility-
 - c. contractibility –
 - d. elasticity –
3. Compare the general location, microscopic appearance, control, and functions of the three kinds of muscle tissue.

Type	Location	Appearance	Control	Functions
Skeletal				
Smooth				
Cardiac				

4. Identify the proteins which compose the thick and thin myofilaments.
5. Describe the sliding-filament theory of muscle contraction.
6. Describe the role of each of the following structures in muscle contraction: a. motor neuron: b. neuromuscular junction: c. motor end plate: d. Ach or Acetylcholine: e. Motor unit

MUSCULAR SYSTEM REVIEW

1. Identify the general functions of the muscular system

Motion by moving the skeletal levers of the body

Posture - stabilizing body positions

Regulation of organ volume

Thermogenesis - heat production

Protection of internal organs

2. Define the four characteristics of muscular tissue

a. **irritability (excitability) - The ability of muscle tissue to receive and respond to a stimulus such as a nerve impulse.**

b. **extensibility- The ability of muscle tissue to be elongated or stretched.**

c. **contractibility – The ability of muscle tissue to become short and thick while producing movement.**

d. **elasticity – The ability of muscle tissue to return to its normal resting length after it has been stretched or contracted**

3. Compare the general location, microscopic appearance, control, and functions of the three kinds of muscle tissue.

Type	Location	Appearance	Control	Functions
Skeletal	Att. to bones	striated	voluntary	movement
Smooth	interior surfaces	non-striated	involuntary	propulsion
Cardiac	Heart	striated	involuntary	pump heart

4. Identify the proteins which compose the thick and thin myofilaments.

Actin : thin, light-colored myofilaments

Myosin : thick, dark-colored myofilaments

5. Describe the sliding-filament theory of muscle contraction.

During muscle contraction, the globular heads of the myosin attach to the active site of the actin myofilament and “ratchet” or swivel pulling the actin toward the center of the sarcomere (unit of contraction). This causes the actin myofilaments to slide past one another resulting in a shortening of a sarcomere. The sarcomere shortens and the muscle contracts

6. Describe the role of each of the following structures in muscle contraction: a. motor neuron: b. neuromuscular junction: c. motor end plate: d. Ach or Acetylcholine: e.

Motor unit

a. **motor neuron: a nerve that carries impulses from the brain and stimulates muscles to contract**

b. **neuromuscular junction: the end of the axon terminal where it attaches to the muscle fiber**

c. **motor end plate: the location on the muscle fiber at the end of the axon terminal**

d. **Ach or Acetylcholine: the neurotransmitter released from the synaptic vesicles that initiates an action potential in the muscle fiber**

e. **Motor unit: a motor neuron and the muscle fibers it innervates**

7. Define the following terms:

- a. origin**
- b. insertion**

8. Explain each of the following with regard to muscular contraction.

- a. prime movers**
- b. antagonists**
- c. synergists**
- d. fixators**

9. Describe the general locations and functions of the following skeletal muscles:

- a. biceps brachii**
- b. triceps brachii**
- c. sternocleidomastoid**
- d. trapezius**
- e. deltoid**
- f. pectoralis major**
- g. latissimus dorsi**
- h. diaphragm**
- i. gastrocnemius**
- j. hamstrings**
- k. quadriceps**
- l. gluteus maximus**

7. Define the following terms:

- a. origin - body segment with the most mass; usually more proximally located; usually has larger surface area of attachment**
- b. insertion -attached to body segment with least mass; usually more distally located; usually has smaller surface area of attachment**

8. Explain each of the following with regard to muscular contraction.

- a. prime movers- The muscle that is responsible for the majority of force when a movement is executed**
- b. antagonists-The muscle that performs the opposite movement of the agonist**
- c. synergists- A muscle that assists the agonist by providing additional force or directing the force of the agonist so the movement can be most effectively executed**
- d. fixators- A muscle that functions to stabilize a point or body position.**

9. Describe the general locations and functions of the following skeletal muscles:

- a. biceps brachii- anterior aspect of the upper arm; flexes the forearm**
- b. triceps brachii- posterior aspect of the upper arm; extends the forearm**
- c. sternocleidomastoid- anterior aspect of the neck; flexes the head and neck**
- d. trapezius- posterior aspect of the neck; extends or hyperextends the head and neck**
- e. deltoid- covers the shoulder; abducts the arm**
- f. pectoralis major- chest; adducts the arm**
- g. latissimus dorsi- superficial muscle of the thoracic and lumbar region of the back; extends a flexed arm or hyperextends the arm from the anatomical position**
- h. diaphragm- internal muscle that separates the thoracic and abdominal cavities; deflects the diaphragm inferiorly increasing volume of the thoracic cavity**
- i. gastrocnemius- posterior aspect of the lower leg; plantarflexes the foot**
- j. hamstrings- posterior aspect of the thigh; flexes the lower leg**
- k. quadriceps- anterior aspect of the thigh; extends the lower leg**
- l. gluteus maximus- buttocks region; extends a flexed thigh or hyperextends the thigh from the anatomical position**

10. Describe diseases or disorders associated with muscles.

a. fibromyalgia-

b. muscular dystrophy-

c. shin splints-

10. Describe diseases or disorders associated with muscles.

- a. fibromyalgia- musculoskeletal pain and fatigue disorder for which the cause is still unknown. Fibromyalgia means pain in the muscles, ligaments, and tendons – the soft fibrous tissues in the body.**
- b. muscular dystrophy - A group of genetic diseases characterized by the atrophy of skeletal muscle tissue. The most common form of muscular dystrophy is Duchenne's Muscular Dystrophy in which the skeletal muscle is replaced by fat and fibrous tissue.**
- c. shin splints - Shin splints involves soreness and pain of the front lower leg due to excessive straining of the flexor digitorum longus. It is often a result of walking up and down hills or overbuilding the gastrocnemius.**