

Muscle review

- 1) Skeletal muscle is described by all of the following EXCEPT:
 - a) striated
 - b) voluntary
 - c) multinucleate
 - d) autorhythmic
- 2) The walls of hollow organs and some blood vessels contain this muscle tissue:
 - a) striated
 - b) skeletal
 - c) cardiac
 - d) smooth
- 3) Which of the following is unique to cardiac muscle tissue:
 - a) is involuntary
 - b) is non-striated
 - c) has intercalated discs
 - d) contains smooth muscle tissue
- 4) Approximately what percentage of body heat is generated by muscle tissue:
 - a) 15%
 - b) 30%
 - c) 55%
 - d) 85%
 - e) 98%
- 5) A muscle fascicle is a:
 - a) bundle of myofibrils
 - b) bundle of connective tissue
 - c) bundle of muscle fibers
 - d) muscle cell
- 6) The smallest contractile unit of skeletal muscle is a:
 - a) sarcomere
 - b) motor unit
 - c) synapse
 - d) thin filament
- 7) The major regulatory proteins in muscle tissue are:
 - a) myosin and tropomyosin
 - b) myosin and actin
 - c) actin and troponin
 - d) troponin and tropomyosin

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- 8) Which of the following actions is caused by skeletal muscle:
 - a) constriction of blood vessels
 - b) heartbeat
 - c) dilation of pupil
 - d) eye movements
- 9) Which of the following does NOT occur in a muscle during contraction:
 - a) thick and thin filaments bind to each other
 - b) muscle fibers stretch
 - c) thick and thin filaments "slide" past each other
 - d) muscle fibers shorten
- 10) This process aids in skeletal muscle relaxation after contraction:
 - a) calcium is released from intracellular storage sites
 - b) motor neurons send electrical signal to muscle
 - c) acetylcholinesterase degrades acetylcholine
 - d) troponin binds calcium
- 11) The stiffness of muscle tissue in rigor mortis partially results from:
 - a) excessive acetylcholine activity on muscle
 - b) excessive calcium release in muscle
 - c) excessive lactic acid build up
 - d) excessive contraction of the fibers
- 12) A single motor neuron may innervate as few as 3-5 fibers in muscles of the:
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- 13) When an action potential reaches the presynaptic terminal of the motor neuron:
- a) calcium is released inside of the muscle fiber
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 - c) acetylcholinesterase is released into the synaptic cleft
 - d) physical contact between the motor neuron and the muscle fiber occurs
- 14) Lack of acetylcholinesterase in the synaptic cleft would result in:
- a) decrease acetylcholine production by the motor neuron
 - b) relaxation of the muscle fiber
 - c) **excessive, continuous stimulation of the muscle fiber**
 - d) inability of the motor neuron to stimulate the muscle fiber
- 15) Curare, a toxin, blocks the acetylcholine receptors on muscle tissue. This would result in:
- a) increased stimulation of the muscle fiber
 - b) **inability of the muscle to respond to motor nerve stimulus**
 - c) contraction of the muscle fiber
 - d) excessive contractions and convulsions
- 16) Training excersizes such as jogging, swimming and aerobics have this effect on skeletal muscle tissue:
- a) increase number of mitochondria per muscle fiber
 - b) increase number of muscle fibers
 - c) increase number of motor units
 - d) increase number of skeletal muscles
- 17) Muscular dystrophy is a congenital disorder characterized by
- a) **skeletal muscle degeneration**
 - b) excessive convulsions
 - c) shaking and trembling
 - d) only cardiac damage
- 18) Which of the following disorders is characterized by painful musculoskeletal "tender points":
- a) **fibromyalgia**
 - b) myasthenia gravis
 - c) Duchenne muscular dystrophy
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- 19) Anabolic steroids have all these effects except:
- a) builds muscle proteins
 - b) increases muscle strength
 - c) increases number of muscles in the body
 - d) can result in liver cancer and heart disease
- 20) Which of the following statements regarding aging and the muscular system is true:
- a) aging is associated with decreased myoglobin production
 - b) the effects of aging can be nearly completely reversed
 - c) satellite cells increase in aging causing fibrosis
 - d) young persons have more adipose in muscles compared to elderly persons

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A muscle fascicle is a bundle of:

- a) myofibrils
- b) fibers
- c) filaments
- d) fascia

2. The connective tissue wrapping around a muscle that is continuous with tendons is the:

- a) perimysium
- b) endomysium
- c) epimysium
- d) sarcolemma

3. Which of the following is NOT a major function of muscle tissue:

- a) produce body heat
- b) body movements
- c) controlling volume of hollow organs
- d) storage of neurotransmitters

4. What is the smallest unit of contraction in muscle fibers:

- a) sarcomere
- b) sarcolemma
- c) sarcoplasm
- d) sarcofilament

In muscle tissue, neurotransmitter receptors are located:

- a) in synaptic vesicles
- b) in the synaptic cleft
- c) on the motor neuron axon terminals
- d) on the motor end plate

6. An action potential is:

- a) a migrating region where the electrochemical potential of a membrane undergoes reversal
- b) a flow of electrons from one cell to another
- c) an electrically charged molecule such as sodium or potassium ions
- d) a region where the electrochemical gradient of a membrane causes acetylcholine production

7. Acetylcholinesterase:

- a) produces acetylcholine
- b) is the acetylcholine receptor in muscle tissue
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Tetanus toxin causes convulsive paralysis by:

- a) binding to acetylcholine receptor and blocking acetylcholine
- b) inhibiting acetylcholine esterase
- c) causing massive acetylcholine release from motor neurons
- d) blocking nearly all acetylcholine release from motor neurons

9. A person suffering from nerve gas exposure is given atropine to counteract the effects. Why?:

- a) atropine will bind to nerve gas and help inactivate
- b) atropine will block the sites where nerve gas acts
- c) atropine blocks acetylcholine receptor which blocks the excess acetylcholine lingering in the synaptic cleft
- d) atropine will inactivate acetylcholine esterase and allow more acetylcholine to cross the synaptic cleft

10. Which of the following statements is FALSE:

- a) all muscle tissue acts by contraction only
- b) of the three types of muscle tissue, only skeletal is voluntary
- c) superficial fascia holds skin to muscle
- d) muscles use the skeletal system as leverage points by pushing against the bones to produce body movement

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FACTORS NECESSARY TO HAVE MUSCLE EXCITABILITY

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- A. Cell membrane must be semipermeable
- B. High extracellular concentration of sodium ions(Na^+)

- 1. extracellular sodium ions are 10 times greater than intracellular sodium ions.

- C. High intracellular concentration of potassium ions(K^+)

- 1. intracellular potassium is 30 times higher than extracellular potassium

- D. Negative intracellular voltage

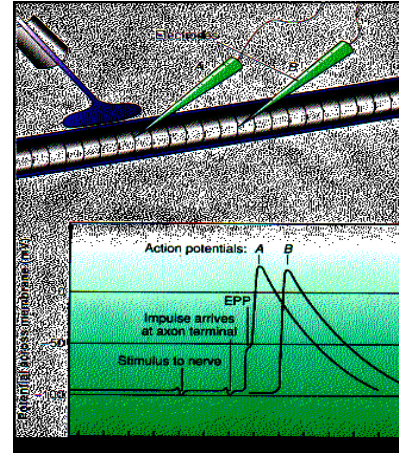
1. negatively charged protein ions are prevented from exiting muscle cell; combined with the positively charged potassium ions that slowly leak out of the cell, they provide an overall negative charge to the inside of the cell.

Sarcolemma in muscle physiology?

Sarcolemma

The outside (extracellular) face is positive, while the inside face is negative
This difference in charge is the resting membrane potential
The predominant extracellular ion is Na^+
The predominant intracellular ion is K^+
The sarcolemma is relatively impermeable to both ions

end plate potential (EPP)



Arrival of a nerve impulse at the axon terminal of the motor neuron

causes acetylcholine to be released into the neuromuscular junction which creates an **end plate potential (EPP)** in the membrane beneath it (A) but not farther away (B).

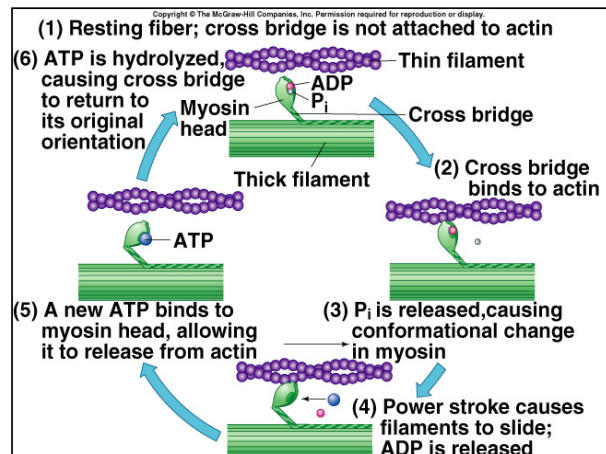
When the EPP reaches the threshold of the fiber (about -50 mV), an **action potential** is generated that sweeps along the fiber (B)

SEQUENCE OF EVENTS LEADING TO RELAXATION OF MUSCLE FOLLOWING CONTRACTION

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1. Calcium ions actively transported back into sarcoplasmic reticulum.
 - a. Action of Calsequestrin = promotes the calcium pump
 2. Lack of calcium ions in cytoplasm stops enzymatic action of myosin.
 - a. No more ATP broken down by ATP-ASE so no energy available for further contraction.
 3. Adenosine diphosphate (ADP) is converted back into Adenosine Triphosphate (ATP)
 4. Once the Ca^{++} is gone from the filaments and the ATP is regenerated, the actin and myosin slide apart and the sarcomere lengthen again. When this happens throughout the muscle cell, the muscle cell is said to relax (regain its resting length).
- NOTE:** Troponin-tropomyosin binding reoccurs. Remember that calcium normally unbinds the Troponin-tropomyosin complex.

What are The three connective tissue sheaths enrolling the skeletal muscle



Skeletal Muscle

- The three connective tissue sheaths are:
 - Endomysium – fine sheath of connective tissue composed of reticular fibers surrounding each muscle fiber
 - Perimysium – fibrous connective tissue that surrounds groups of muscle fibers called fascicles
 - Epimysium – an overcoat of dense regular connective tissue that surrounds the entire muscle

Isotonic

Isometric

Eccentric

Isotonic contractions:

Force of contraction remains constant throughout the shortening process.

Isometric contractions:

Length of muscle fibers remain constant.

Eccentric contractions:

Force exerted on a muscle to stretch is greater than the force of muscle contraction.

Running downhill

Excitation-Contraction (EC) Coupling?

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Action potential generated and propagated along sarcomere to T-tubules

Action potential triggers Ca^{2+} release

Ca^{++} bind to troponin; blocking action of tropomyosin released

contraction via crossbridge formation; ATP hydrolysis

Removal of Ca^{+2} by active transport

tropomyosin blockage restored; contraction ends

What primarily determines the power of a muscle?

- A. the length
- B. the shape
- C. the number of neurons innervating it
- D. the total number of muscle cells available for contraction

The muscles that are found at openings of the body are collectively called _____.

- A. convergent muscles
- B. circular muscles
- C. parallel muscles
- D. divergent muscles

Paralysis of which of the following would make an individual unable to flex his thigh?

- a. iliopsoas
- b. biceps femoris
- c. semitendinosus
- d. vastus medialis

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true false questions

1./The soleus is a synergist of the gastrocnemius used in plantar flexion.

2./ Muscle power does *not* depend on the direction of the fascicles.

3./ The epicranium or occipitofrontalis has two bellies, the frontal and occipital.

4./ The arrangement of a muscle's fascicles determines its range of motion and power.

5./ The calcaneal tendon (Achilles tendon) is the largest, strongest tendon in the body.

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What is the most abundant storage form of energy within a muscle fiber?

- A)Glycogen
- B)ADP
- C)ATP
- D)creatine phosphate

The main neurotransmitter involved in skeletal muscle contraction is _____.

- A)adrenalin
- B)noradrenalin
- c/ acetylcholine
- d/ dopamine

During the contraction of a sarcomere, calcium ions bind with the protein _____.

- A)actin
- B)myosin
- c./troponin
- d./tropomyosin

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The anatomic contractile unit of a muscle is the:

Muscle cells are specialized for contractility, and they can be classified according to their microscopic appearance into 3 categories what are they:

The anatomic contractile unit of a muscle is the:

- a. Myofibril
- b. A band
- c. Z band
- d. Sarcomere

Muscle cells are specialized for contractility, and they can be classified according to their microscopic appearance into 3 categories what are they:

- Smooth muscle which is found primarily in tubular organs.
- Skeletal muscle which is generally attached to bones.
- Cardiac muscle which is found in the wall of the heart.

The motor unit consists of:

Define Purkinje Fibers:

The motor unit consists of:

- a. A myofiber and all the axons that innervate it
- b. An axon and all the myofibers it innervates
- c. All the myofibers in a single fascicle
- d. The myofilaments comprising a single sarcomere

Define Purkinje Fibers:

specialized cardiac muscle fibers extending from A-V septum and lateral ventricle walls to supply ventricular muscle

The _____ is known as the boxer muscle.

The _____ runs deep to the external oblique.

_____ is the main chewing muscle.

A woman mentions to her friend that another person on the beach has great abs.
What is she talking about?

The _____ is known as the boxer muscle.
serratus anterior

The _____ runs deep to the external oblique.
internal oblique

_____ is the main chewing muscle.
Masseter

A woman mentions to her friend that another person on the beach has great abs. What is she talking about?

The woman is referring to well-developed rectus abdominis muscles on some individual.
This is a term coined by bodybuilders and refers to the bulging muscles between the tendinous intersections.

When an AP reaches the presynaptic terminal of the motor neuron:

- A. Calcium is released into the muscle fiber
- B. ACh is released into the synaptic cleft
- C. AChase is released into the synaptic cleft
- D. Calcium is released from the motor neuron nucleus

Lack of AChase in the synaptic cleft would result in:

- A. Excessive, continuous stimulation of the muscle fiber
- B. Relaxation of the muscle fiber
- C. Increased Na⁺ synthesis by the muscle fiber
- D. Inability of the motor neuron to conduct further action potentials

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./The hamstring group of muscles includes :

- A. semimembranosus
- B. short head of the biceps femoris
- C. semitendinosus
- D. A and C are correct
- E. A, B and C are correct.

The psoas major muscle

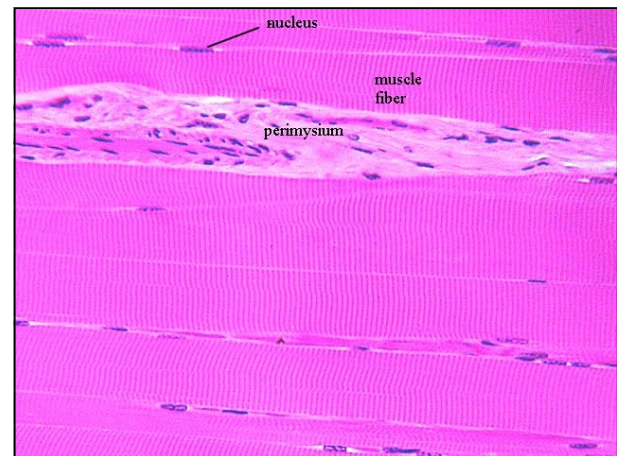
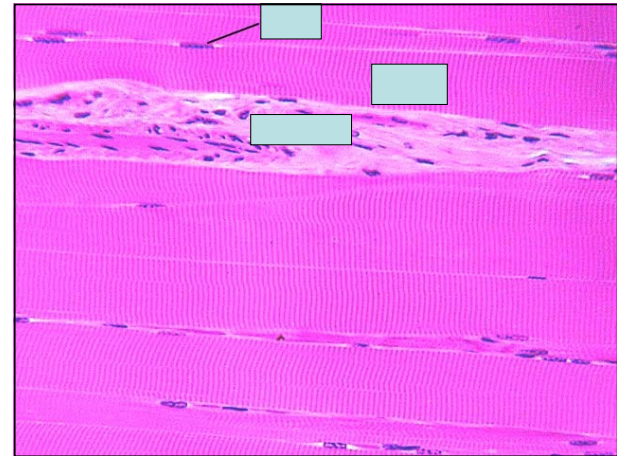
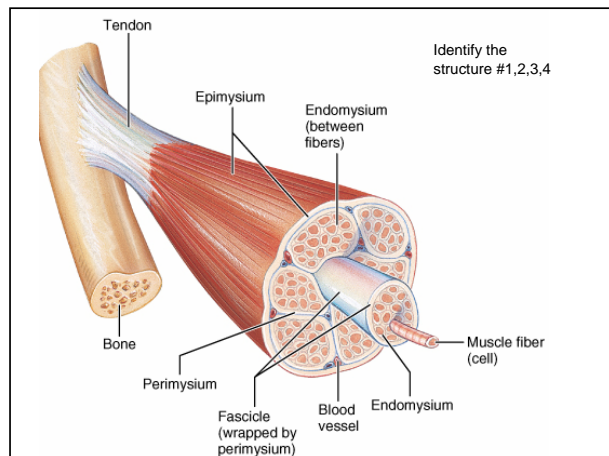
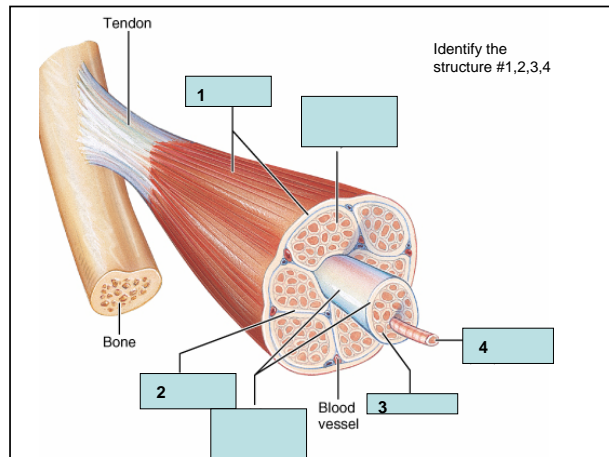
- A. is a lateral rotator of the femur IF the femoral neck is fractured.
- B. is attached to the greater trochanter.
- C. is an extensor of the vertebral column.
- D. receives nerve supply from the obturator nerve.
- E. None of the above is true.

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sarcoplasmic reticulum is the name given to which of the following?

- A. Rough endoplasmic reticulum in smooth muscle cells
- B. Smooth endoplasmic reticulum in cells of the epimysium
- C. Smooth endoplasmic reticulum in all muscle cells
- D. Rough endoplasmic reticulum in cardiac muscle cells

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4./The connective tissue layer that bundles skeletal muscle fibers into fascicles is the:

5./Intercalated disks:
Are found only in :

6./ The antagonist of the sternocleidomastoid is the _____.

4./The connective tissue layer that bundles skeletal muscle fibers into fascicles is the:

Perimysium

5./Intercalated disks:
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cardiac muscle

6./ The antagonist of the sternocleidomastoid is the _____.
splenius capitis

7./what are the Four major muscle groups of the body :

8./What is the plasma membrane of a muscle cell called?

9./what type of muscle do not have sarcomere:

7./what are the Four major muscle groups of the body :

- Muscles of the head and neck;
- Muscles of the trunk;
- Muscles of the upper extremity; and
- Muscles of the lower extremity.

8./What is the plasma membrane of a muscle cell called?
Sarcolema

9./what type of muscle do not have sarcomere:
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10./what are the features to name a muscle?.

10./what are the features to name a muscle?.

•Size:

•Shape:

•Direction of fibers: Location:

•Number of origins:

•Origin and insertion:

•Action:

11./The trapezius muscle is named on the basis of:

a. shape b. size c. location d. action

12/Epicranius (occipitofrontalis) FUNCTION:

13/ NAME THE MOST LONGER MUSCLE IN THE BODY

14/ What type of muscle is composed by spindle type of cells?

11./The trapezius muscle is named on the basis of:

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12/Epicranius (occipitofrontalis) FUNCTION:

These two muscles have alternate actions of pulling the scalp forward and backward

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15/ Troponin and tropomyosin associate with what protein filaments.

16/ The connective tissue wrapping around a muscle that is continuous with tendons is the:

A. Perimysium
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17/ Degrades the neurotransmitter which is found in the neuromuscular junction

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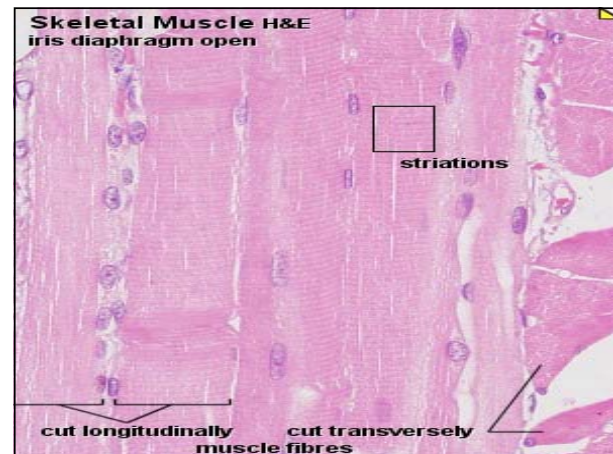
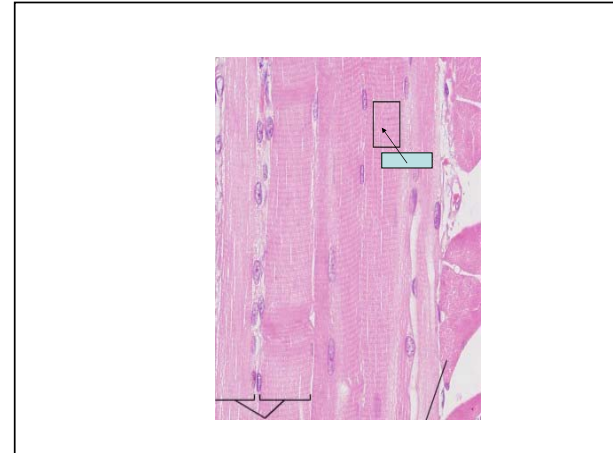
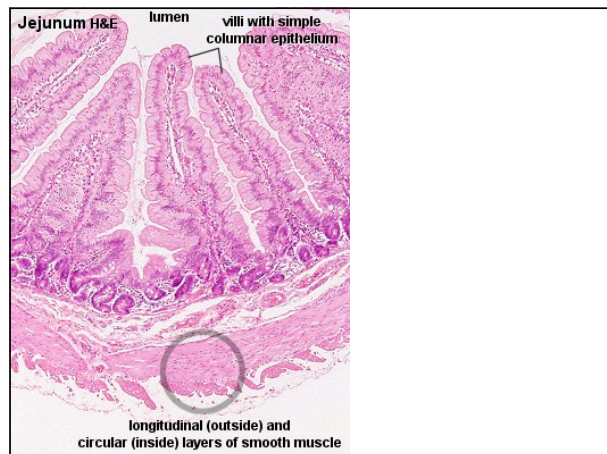
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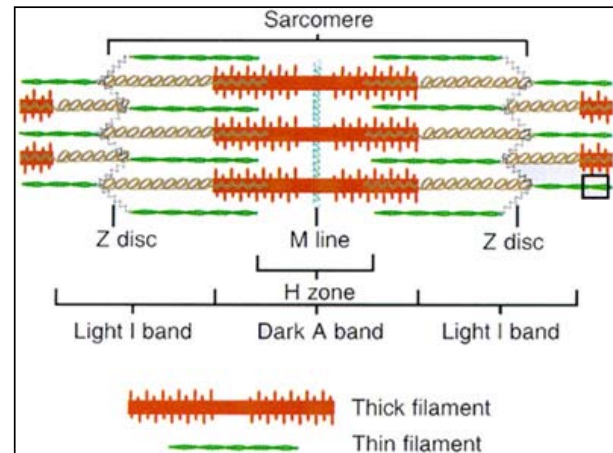
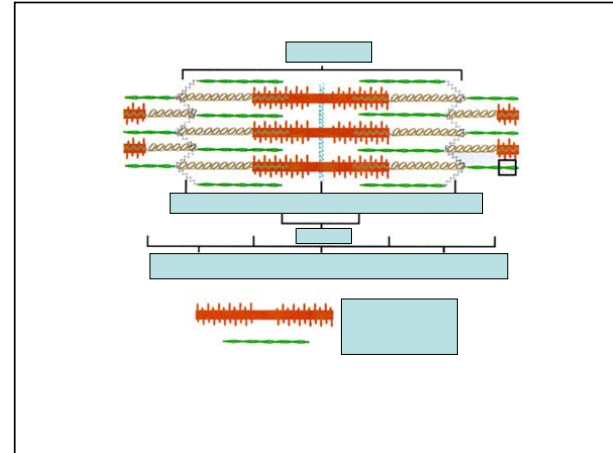
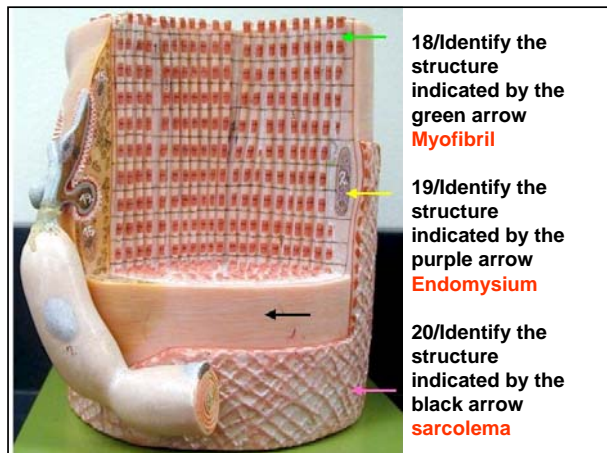
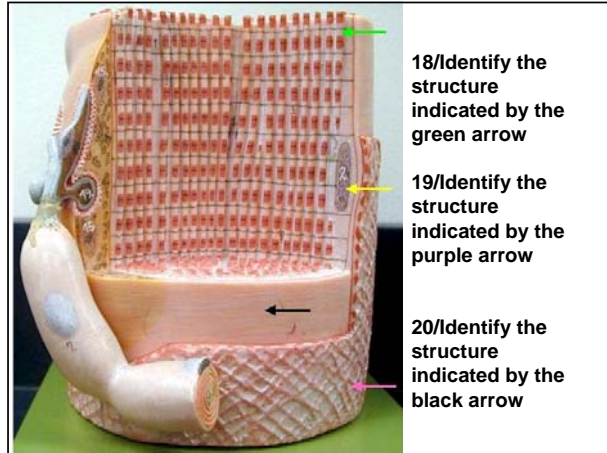
16/ The connective tissue wrapping around a muscle that is continuous with tendons is the:

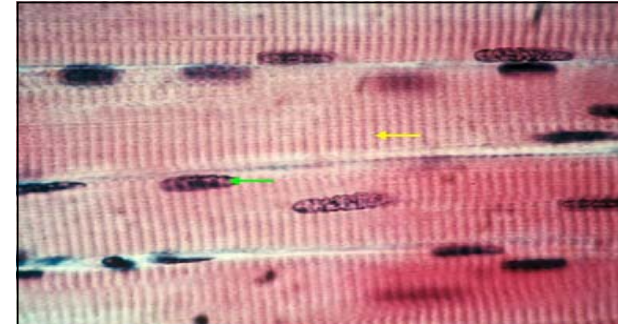
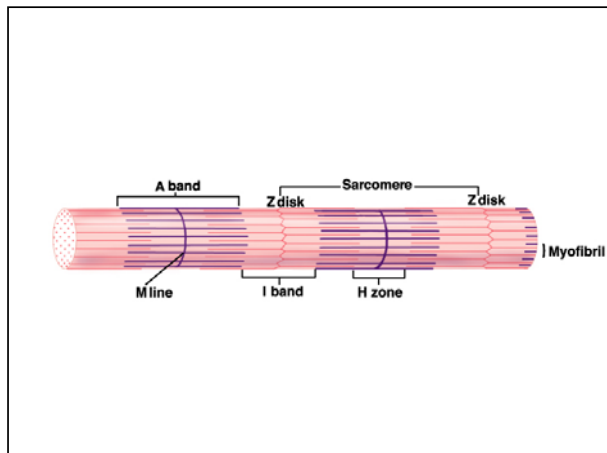
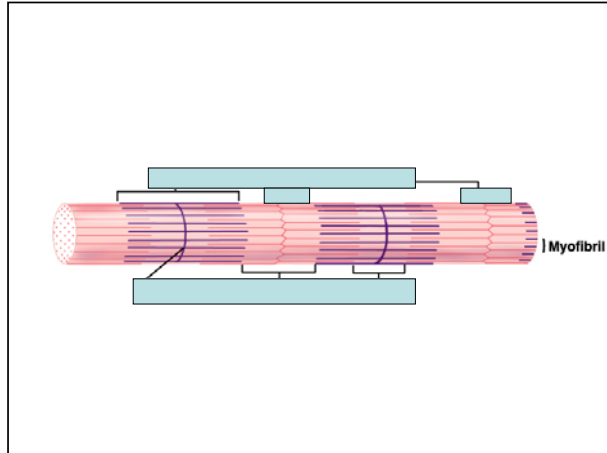
A. Perimysium
B. Endomysium
C. Epimysium
D. Ectomysium

17/ Degrades the neurotransmitter which is found in the neuromuscular junction

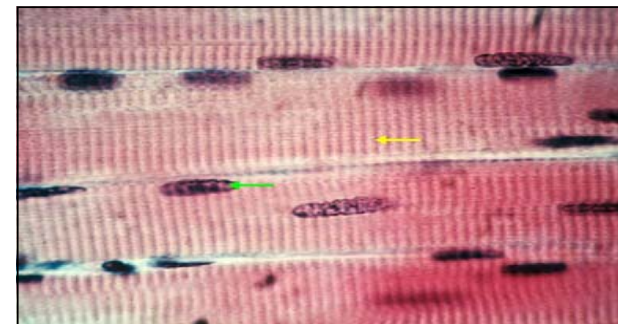
Acetylcholinesterase







21/Identify the tissue.
 22/Identify the structure indicated by the yellow arrow.
 23/ The overlap of _____ creates the structure from the previous question.



21/Identify the tissue. **Skeletal muscle**
 22/Identify the structure indicated by the yellow arrow. **striations**
 23/ The overlap of _____ creates the structure from the previous question.
Actin myosin

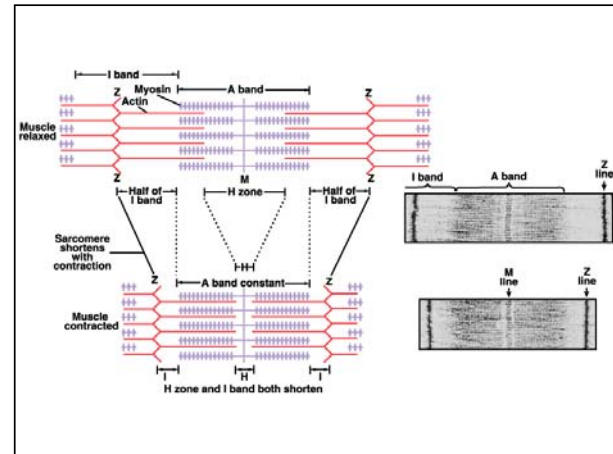
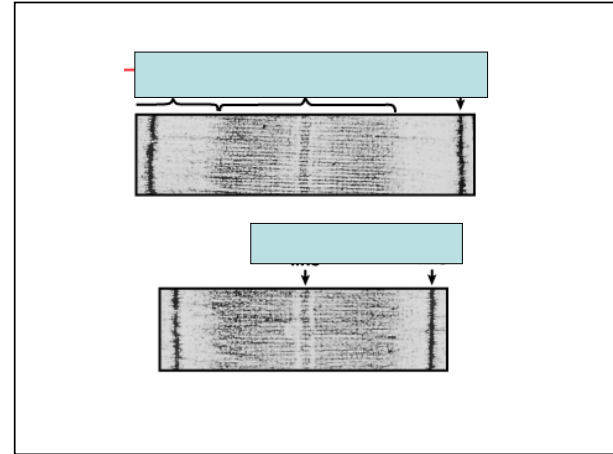


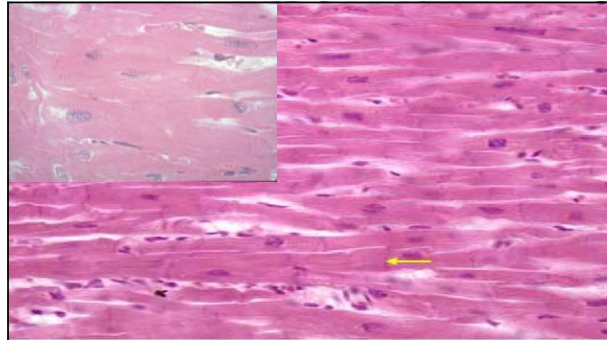
28/Identify this structure



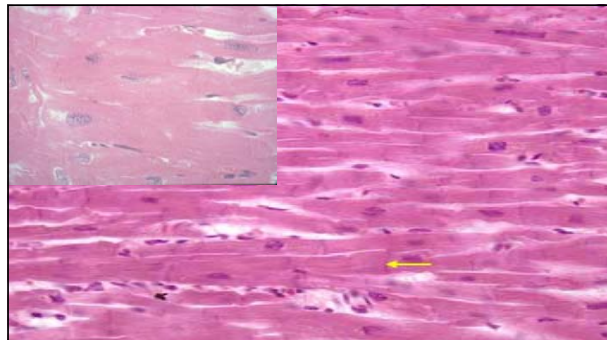
28/Identify this structure:

nmj

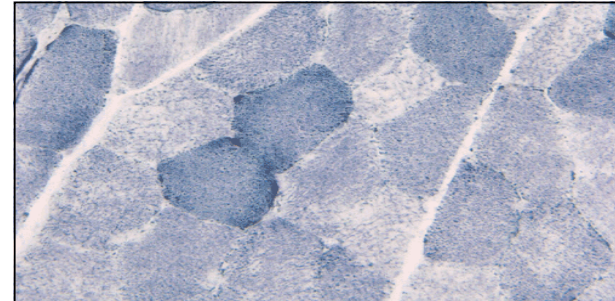




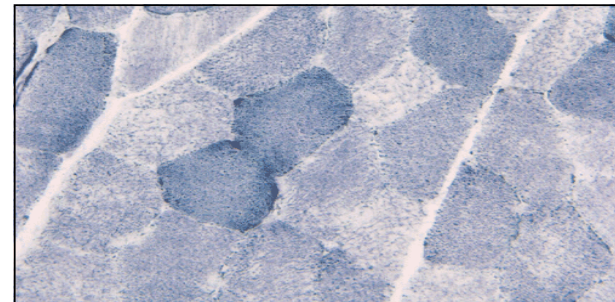
24/ Identify the tissue.
25/Identify the structure indicated by the yellow arrow:



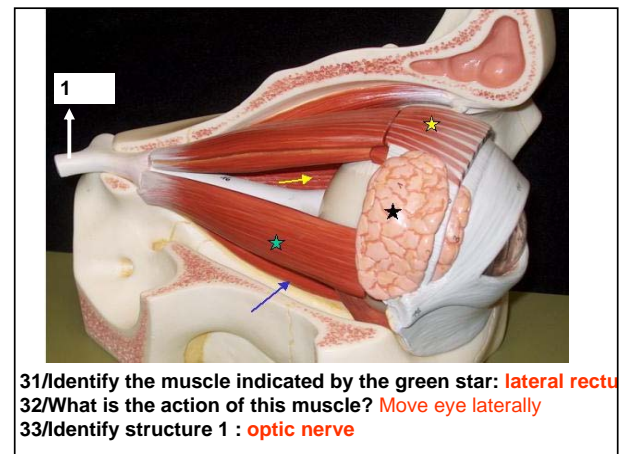
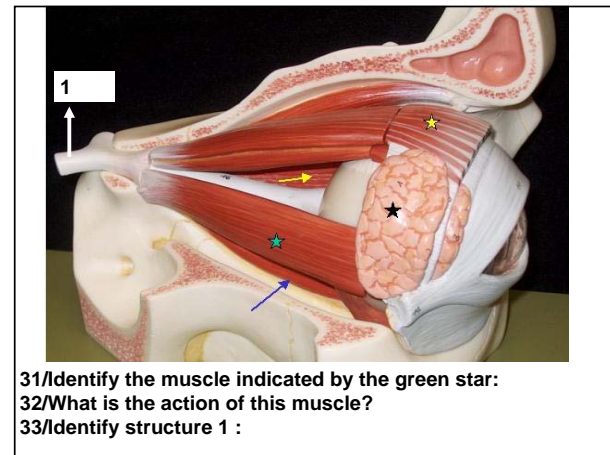
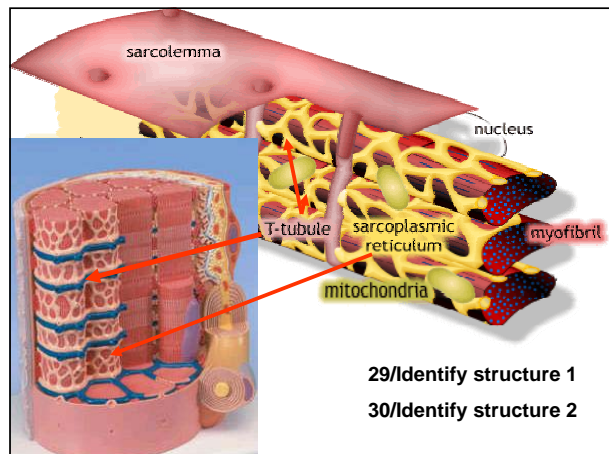
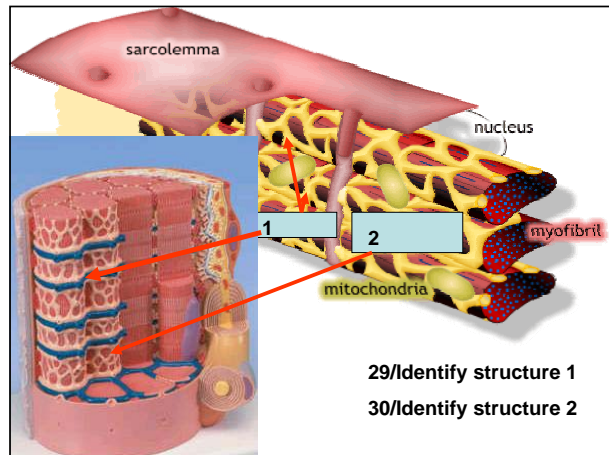
24/ Identify the tissue. **cardiac muscle**
25/Identify the structure indicated by the yellow arrow:
intercalated disk

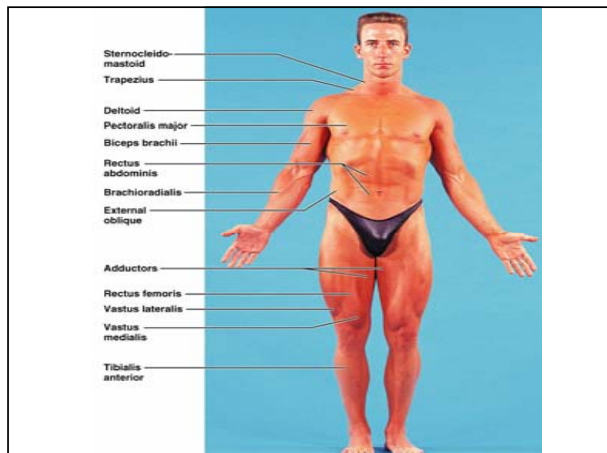


26/ Identify these 2 type of skeletal muscles.
27/What is the functional difference between them?



26/ Identify these 2 type of skeletal muscles. Red
white
27/What is the functional difference between
them?red speed white slower indurance, myoglobin,
mitochondria





34/What muscle is responsible for putting this girl's left eye in its current position?

35/What muscle is responsible for putting this girl's right eye in its current position?



34/What muscle is responsible for putting this girl's left eye in its current position?

Lateral rectus

35/What muscle is responsible for putting this girl's right eye in its current position?

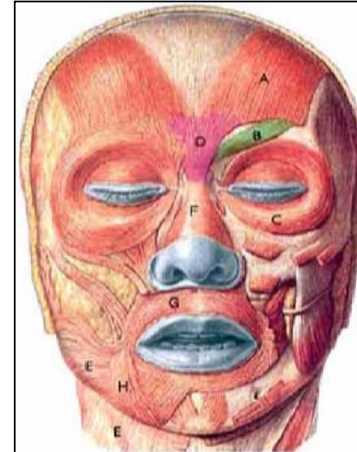
Medial rectus



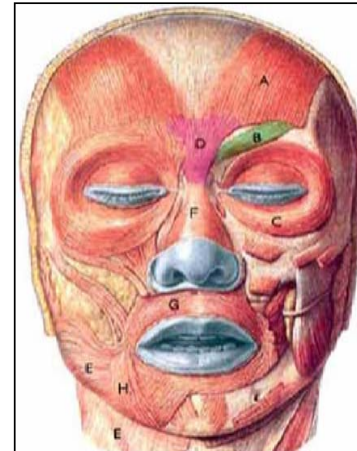
36/ Identify the muscle that raised President Nixon's eyebrows.



36/ Identify the muscle that raised President Nixon's eyebrows.
Frontalis

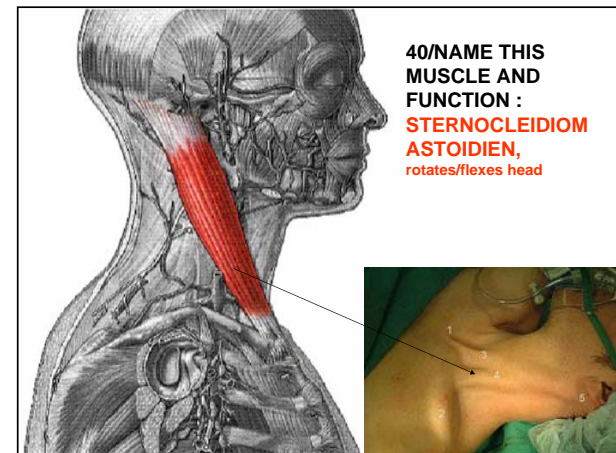
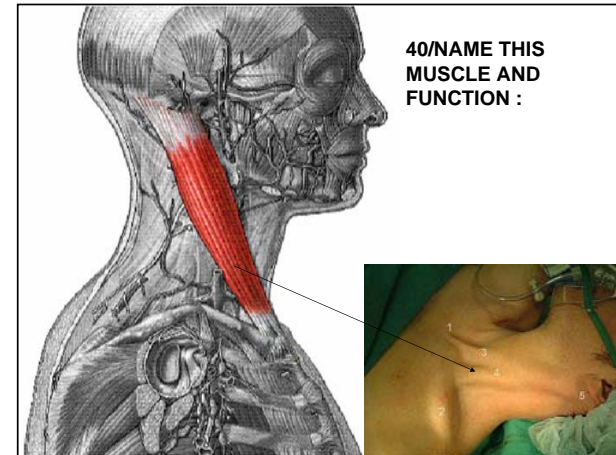
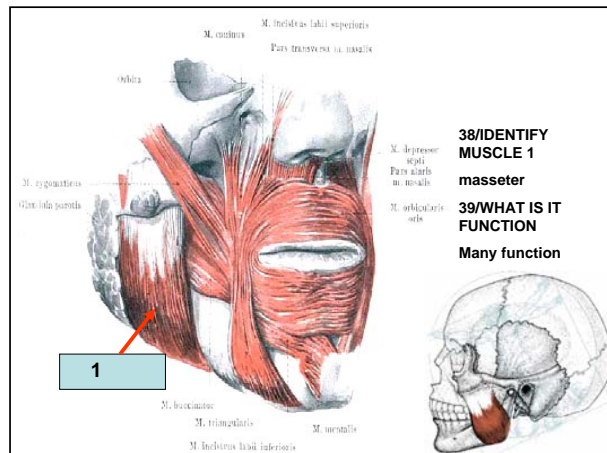
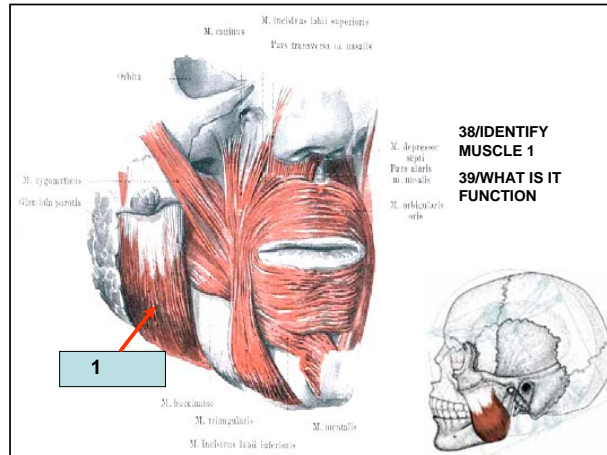


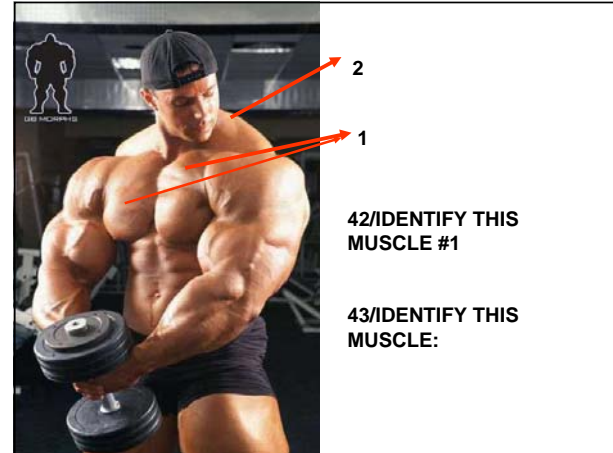
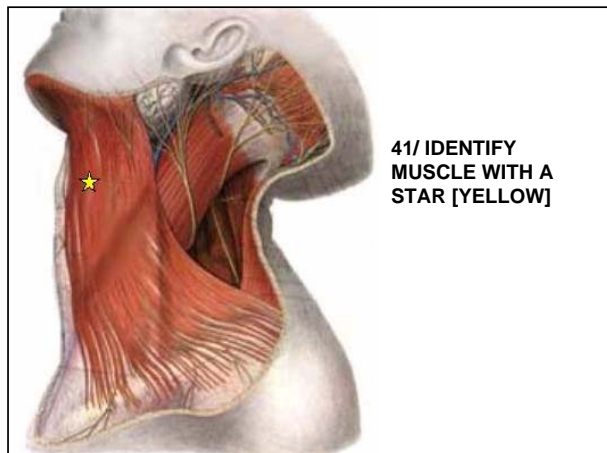
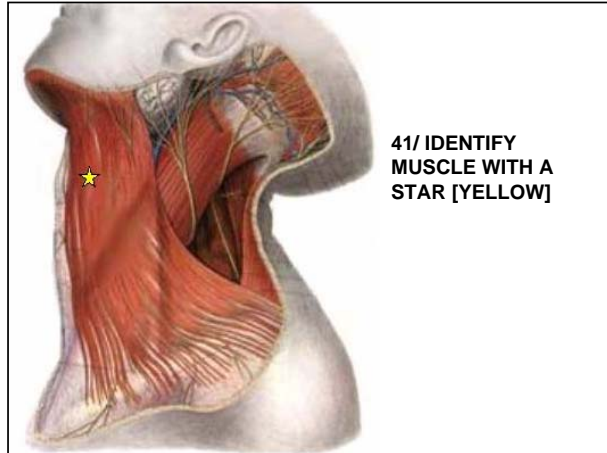
37/Name muscle G

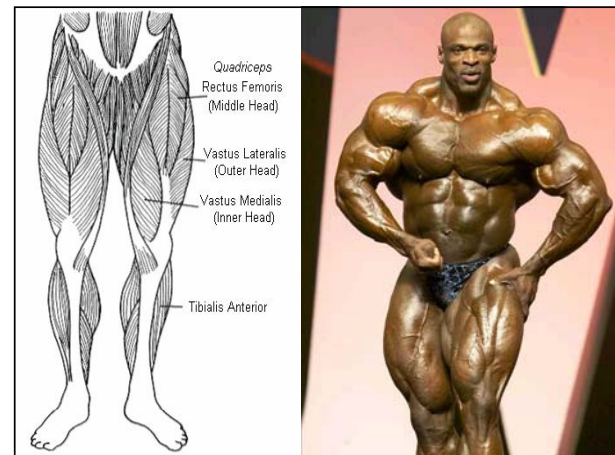
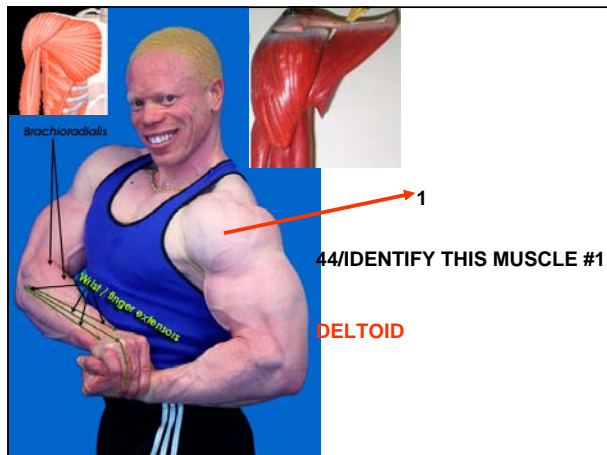


37/Name muscle G

Orbicularisoris



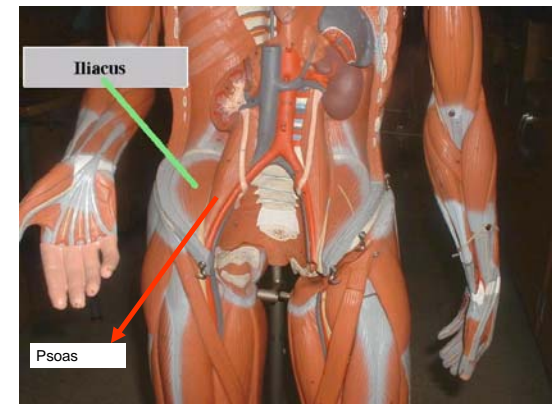
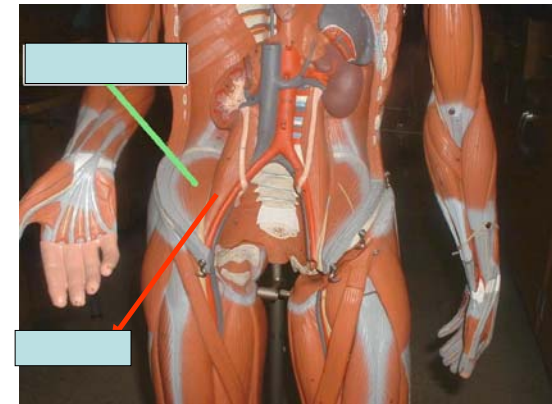


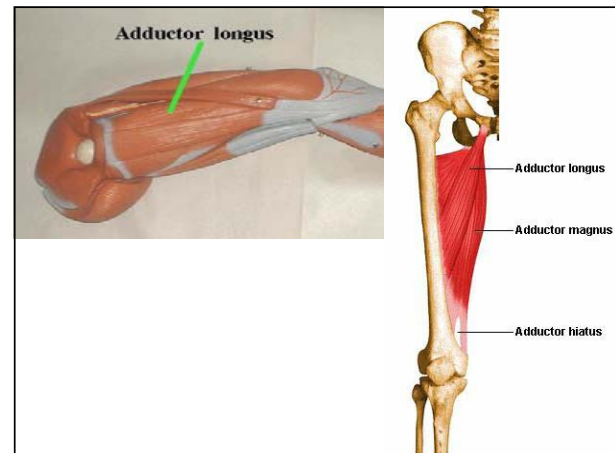
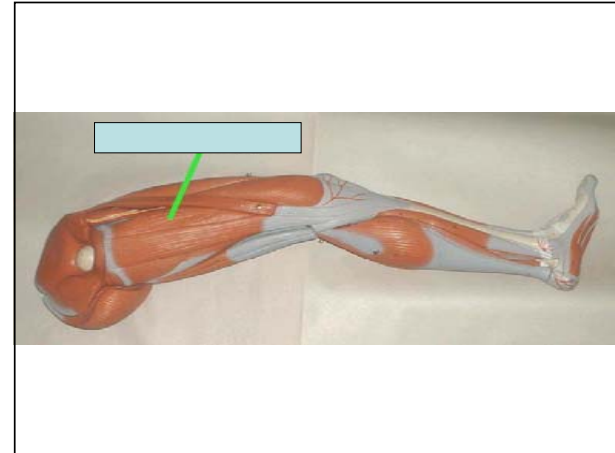
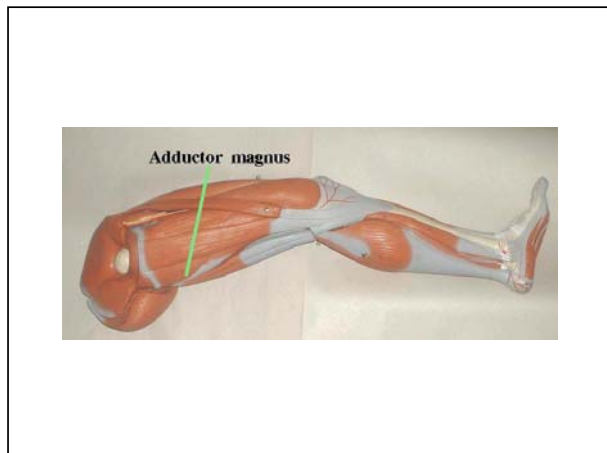
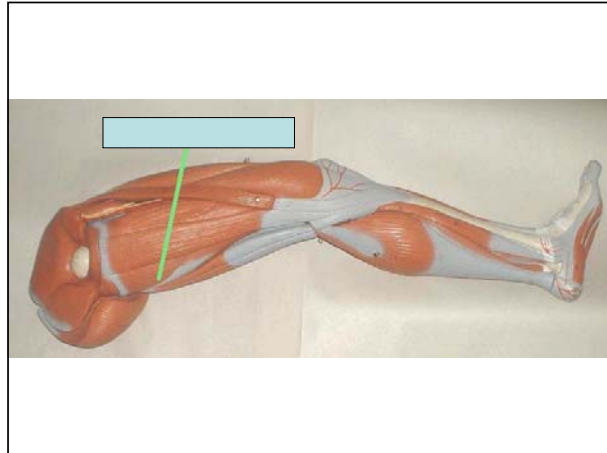


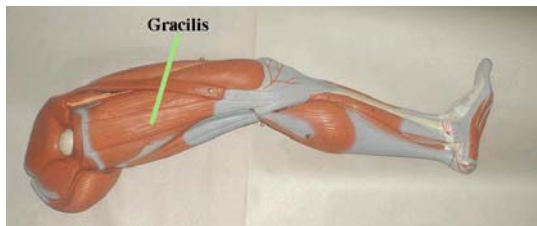
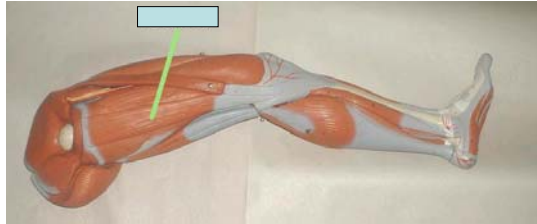
What are the Muscles that move the thigh?

Muscles that move the thigh

- **Iliacus.** The primary action of this muscle is to flex the thigh.
- **Psoas major.** The primary action of this muscle is to flex the thigh.
- **Sartorius.** Notice the way this muscle wraps from the lateral surface of the hip to the medial surface of the knee. As this muscle contracts, the thigh flexes and rotates.
- **Adductor magnus.** As the name implies, this muscle adducts the thigh.
- **Adductor longus.** The primary action of this muscle is to adduct the thigh.
- **Gracilis.** This muscle also adducts the thigh.
- **Tensor fascia latae.** This muscle flexes and abducts the thigh. This muscle inserts onto an aponeurosis called the **iliotibial tract**, which is part of the fascia that covers the thigh muscles (the fascia lata).
- **Gluteus maximus.** This muscle extends the thigh.
- **Gluteus medius*.** This muscle abducts the thigh. It originates on the lateral surface of the ilium, and it inserts on the greater trochanter of the femur.







Adducts hip. Flexes knee and medially rotates flexed knee



45/IDENTIFY THIS MUSCLE

46/DETERMINE THE
INSERTION AND ORIGIN

47/DETERMINE ITS
FUNCTION:



45/IDENTIFY THIS MUSCLE

BICEPS BRACHIALIS

46/DETERMINE THE
INSERTION AND ORIGIN

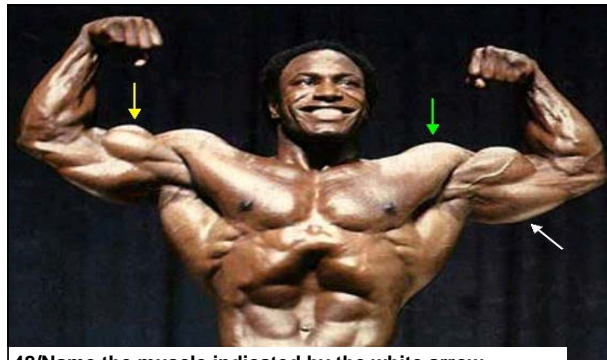
AttachmentsOriginScapula
SupraglenoidTuberosity[1]
CoracoidProcess [2]
InsertionRadius Tubercle [1,
2] Fascia of forearm
BicipitalAponeurosis[1, 2]

47/DETERMINE ITS
FUNCTION:

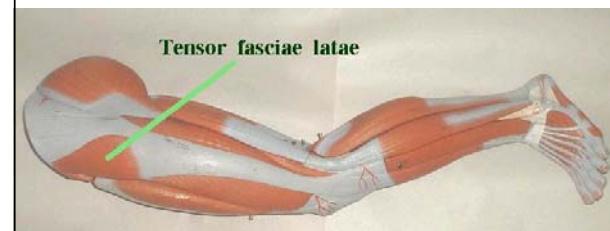
MovementElbow: Flexion [1,
2] Forearm:Supination[1, 2]
Shoulder: Flexion (Weak) [2]
Transverse Flexion (Weak) [2
]

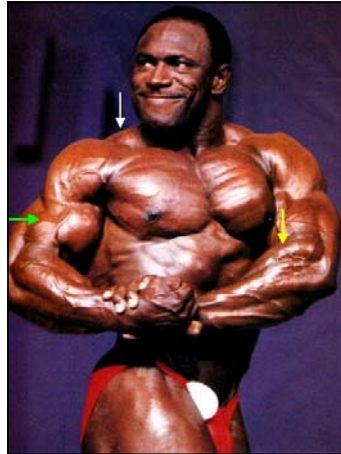


48/Name the muscle indicated by the white arrow.
49What is the primary action of this muscle?

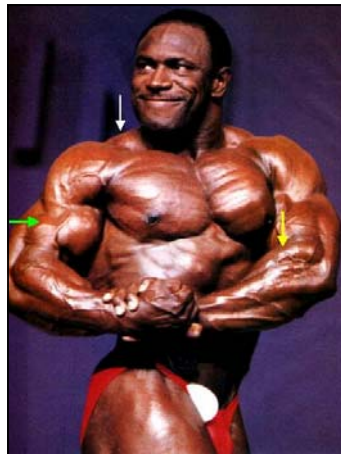


48/Name the muscle indicated by the white arrow.
TRICEPS BRACHII
49What is the primary action of this muscle?
FOREARM EXTENSION

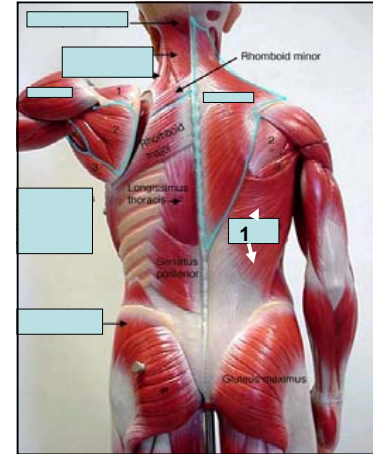




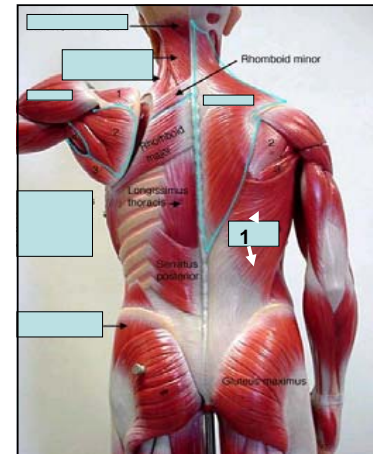
50/Name the muscle indicated by the yellow arrow AND primary action .



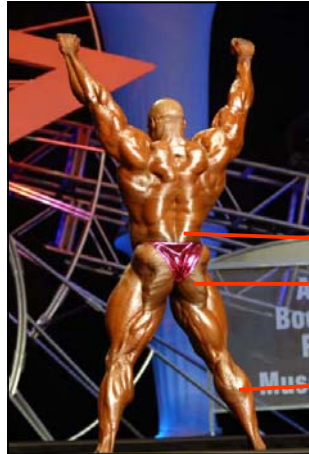
50/Name the muscle indicated by the yellow arrow AND primary action .
BRACHIORADIALIS
FORARM FLEXION



54/IDENTIFY
MUSCLE 1



54/IDENTIFY
MUSCLE 1
LASSITIMUS
DORSI



55/IDENTIFY MUSCLE 1

56/IDENTIFY MUSCLE 2

57/IDENTIFY MUSCLE 3



55/IDENTIFY MUSCLE 1

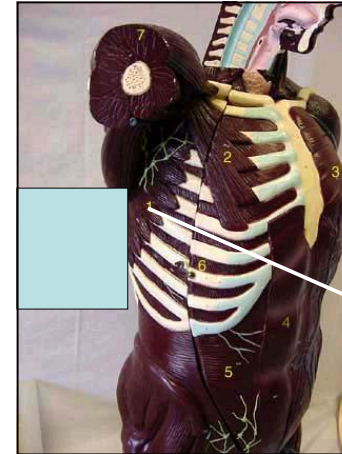
Erector spinae

56/IDENTIFY MUSCLE 2

GLUTEUS MAGNUS

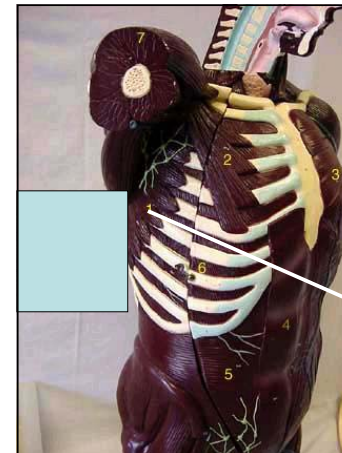
57/IDENTIFY MUSCLE 3

GASTRONEMIUS



58/IDENTIFY 1

59/IDENTIFY 2



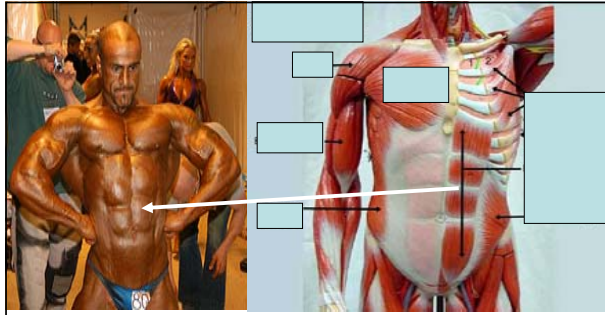
58/IDENTIFY 1

**SERRATUS
ANTERIOR**

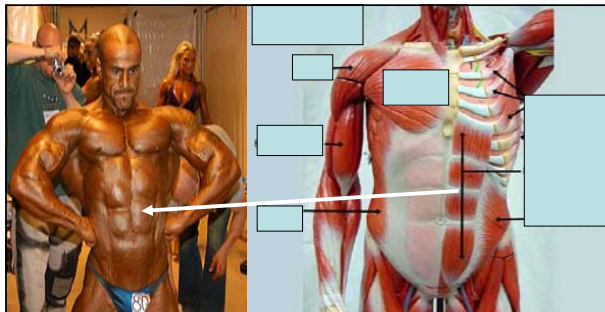
59/IDENTIFY 2

PECTORAL MINOR



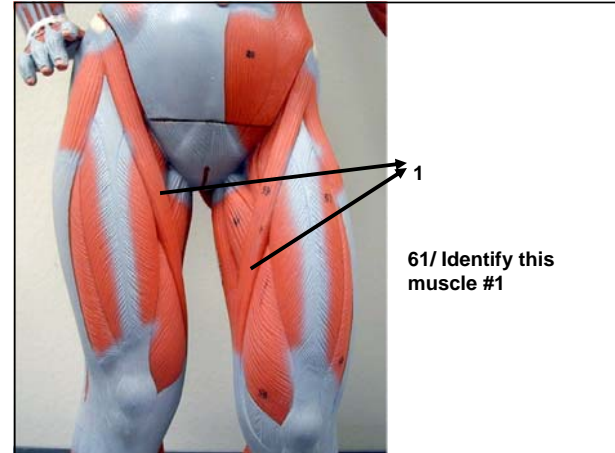


60/IDENTIFY THE WHITE ARROW MUSCLES

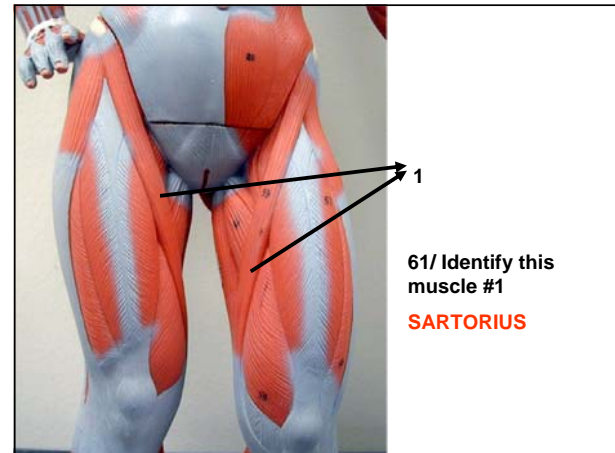


60/IDENTIFY THE WHITE ARROW MUSCLES

RECTUS ABDOMINIS

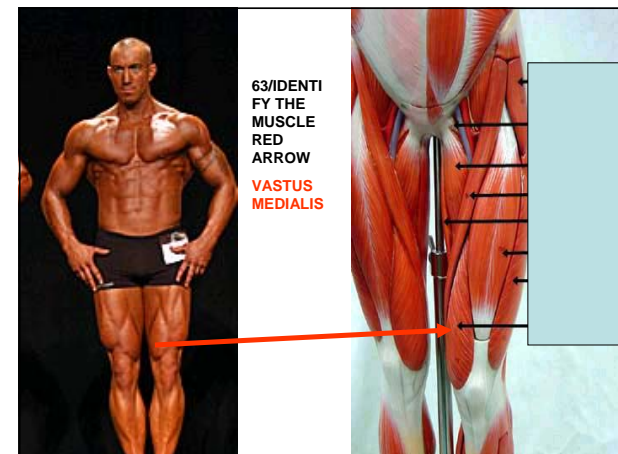
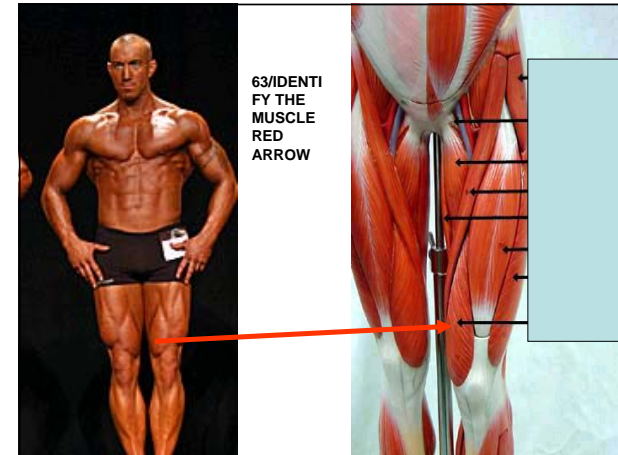
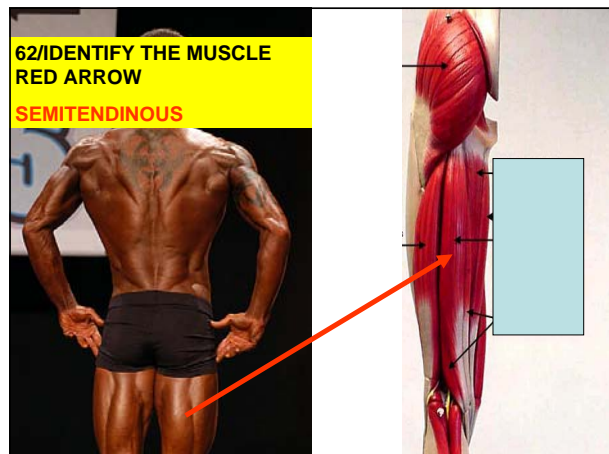
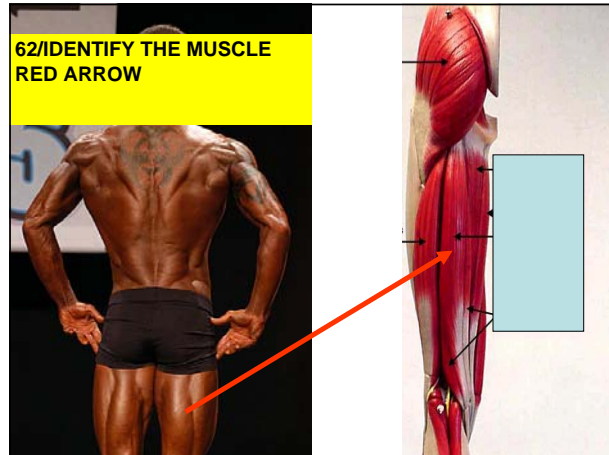


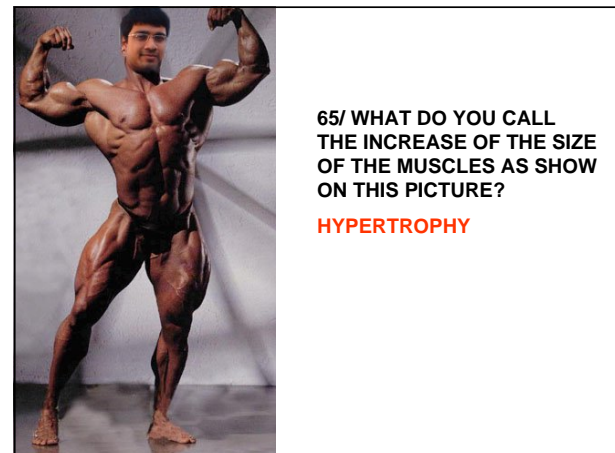
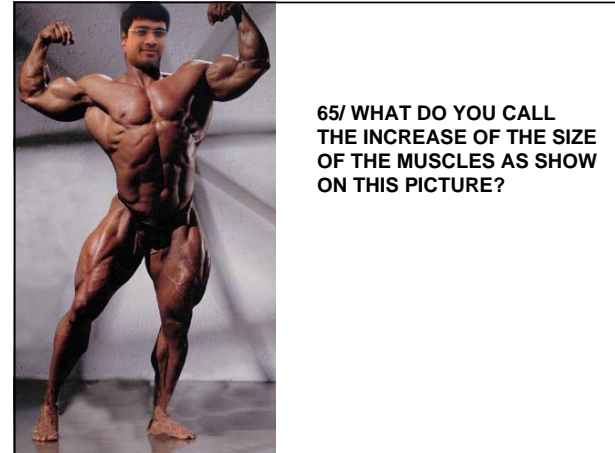
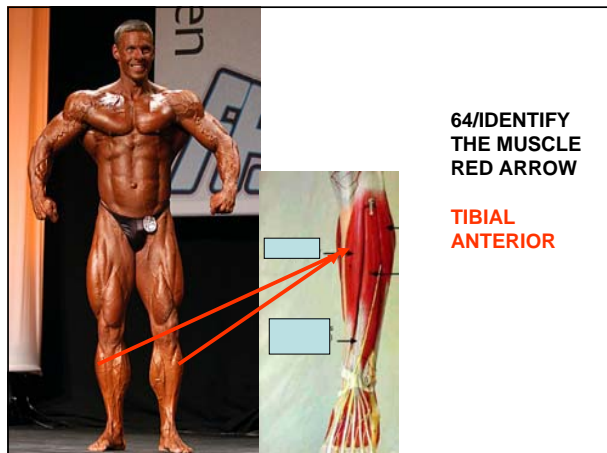
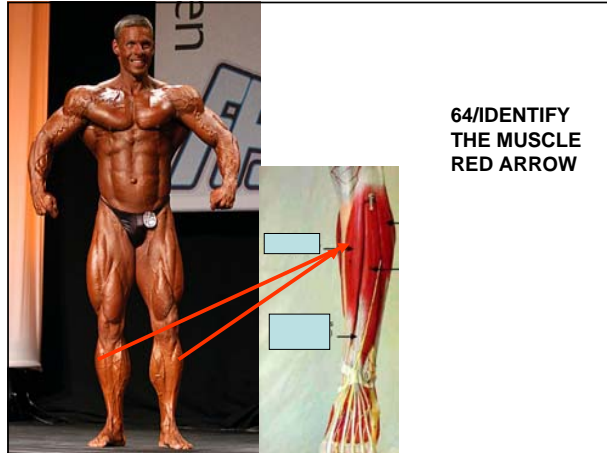
61/ Identify this muscle #1

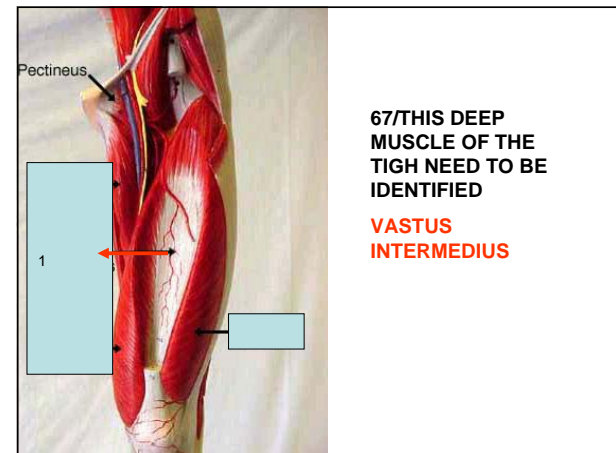
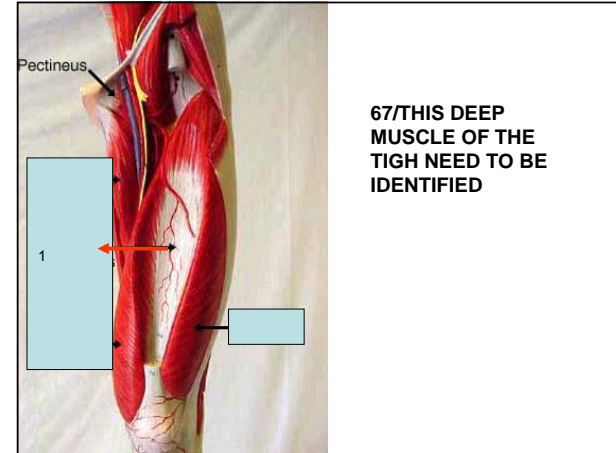
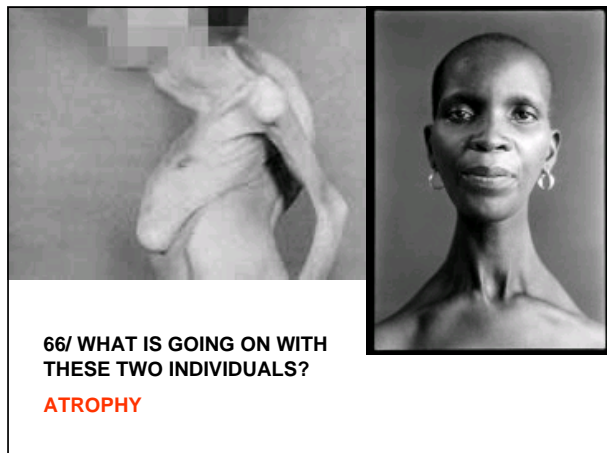
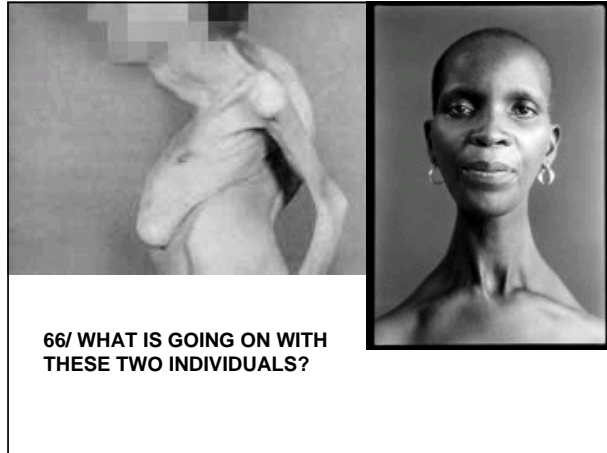


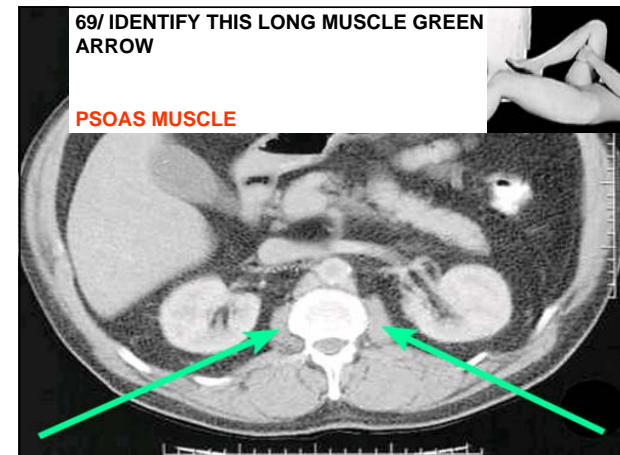
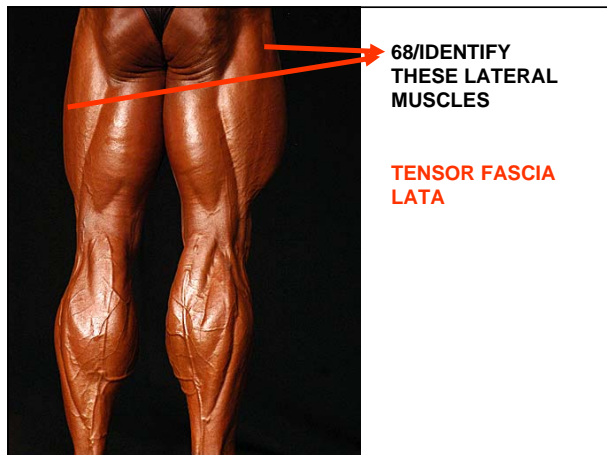
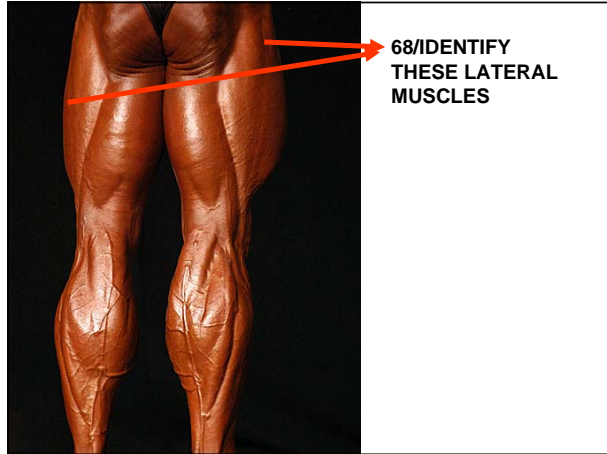
61/ Identify this muscle #1

SARTORIUS











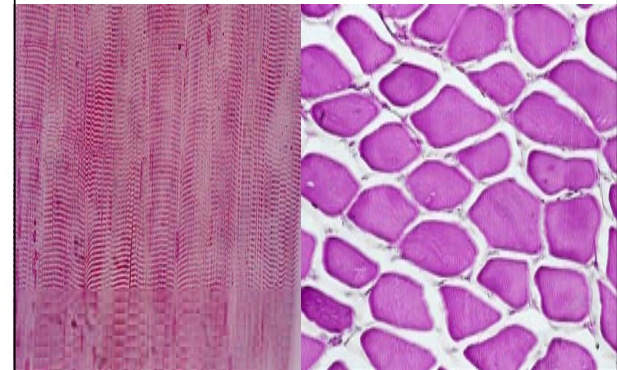
70/THIS CONDITION IS CAUSED BY A BUG THAT HATE OXYGEN, LEADING TO A CONTRACYON OF ALL BODY MUSCLES WITHOUT RELAXATION, ONE OF THE TREATMENT IS PREVENTIVE BY IMMUNIZATION RENEWABLE EVERY 10 YEARS, WHAT IS THIS CONDITION?



70/THIS CONDITION IS CAUSED BY A BUG THAT HATE OXYGEN, LEADING TO A CONTRACYON OF ALL BODY MUSCLES WITHOUT RELAXATION, ONE OF THE TREATMENT IS PREVENTIVE BY IMMUNIZATION RENEWABLE EVERY 10 YEARS, WHAT IS THIS CONDITION?

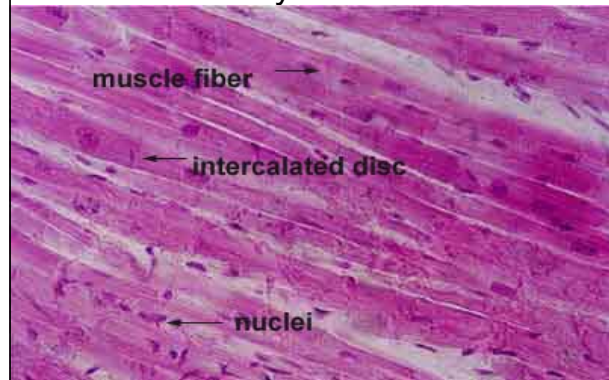
TETANUS

1/What type of muscle is this one?



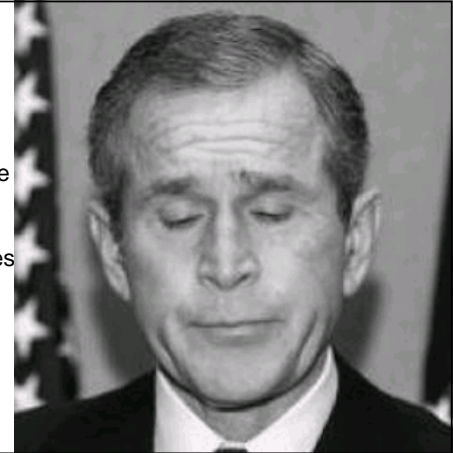
Skeletal muscle

2./identify this muscle



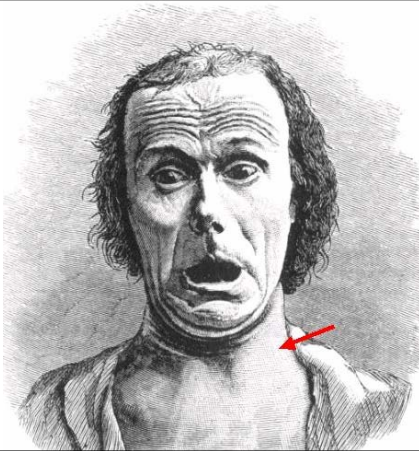
cardiac

3./What muscle is responsible for putting President Bush's eyes in this position?



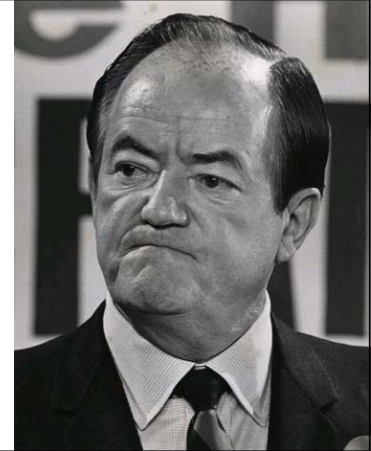
Orbicularis oculi

4/Identify the muscle indicated by the red arrow.



Platysma

5./Identify the muscle responsible for putting Mr. Humphrey's lips in this position.



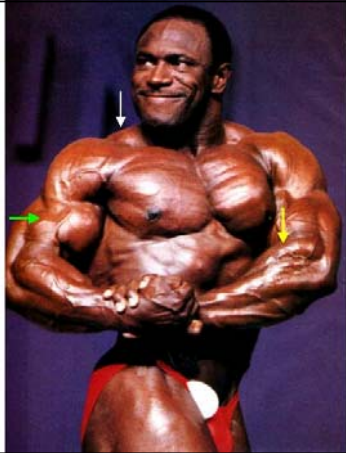
Orbicularis oris

6/Name the muscle indicated by the yellow arrow.

7/What is the primary action of this muscle?

8/Name the muscle indicated by the green arrow.

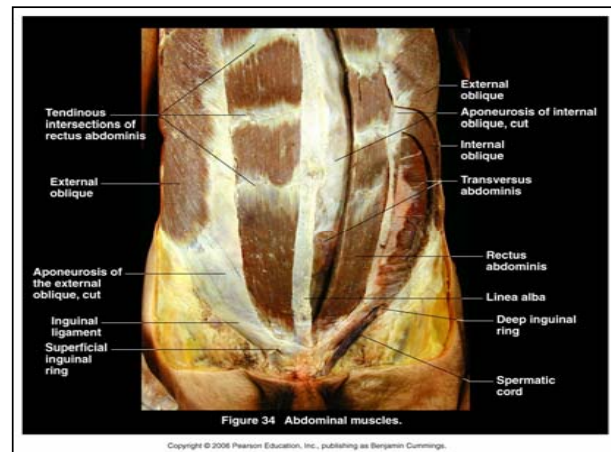
9/What is the primary action of this muscle?

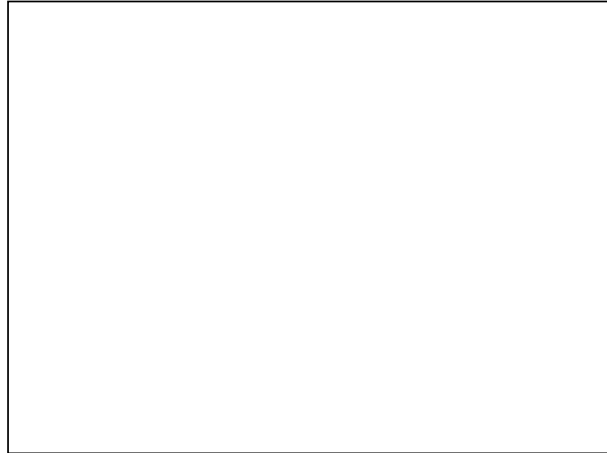


Brachioradialis
for arm flexion

brachialis
for arm flexion

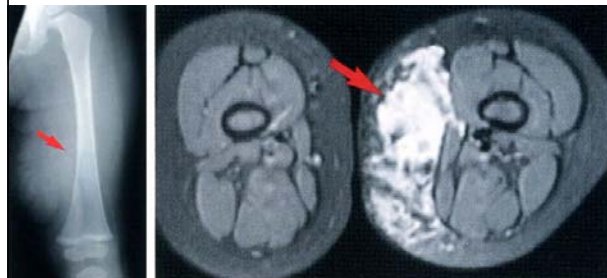
10/
identify





Bonus picture question

What is wrong with this picture and for an extra point your diagnosis



lab

