Muscles Lab Lecture Review

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Tutoring Center Lago

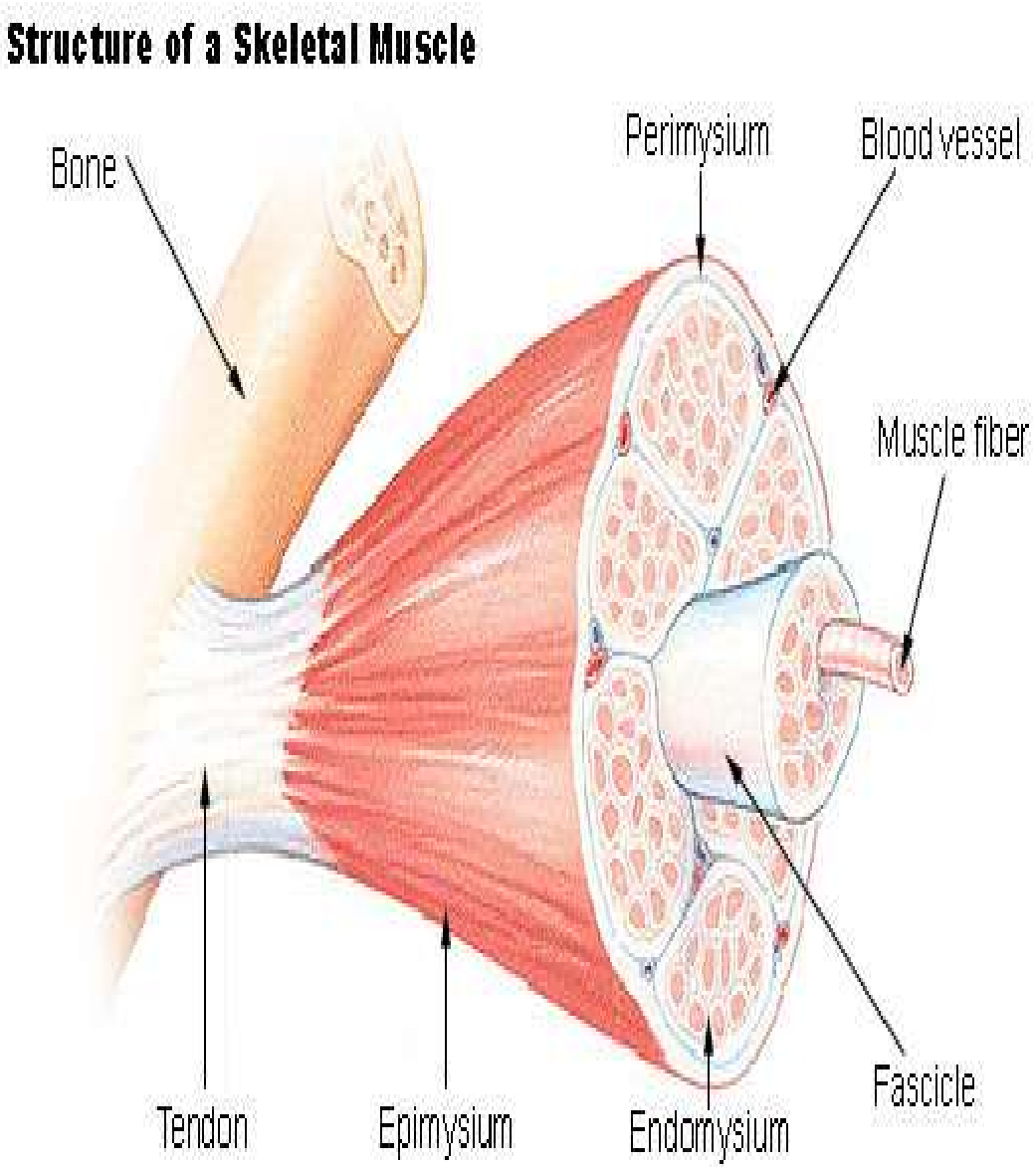
http://sinoemedicalassociation.org/anatomyphysiology

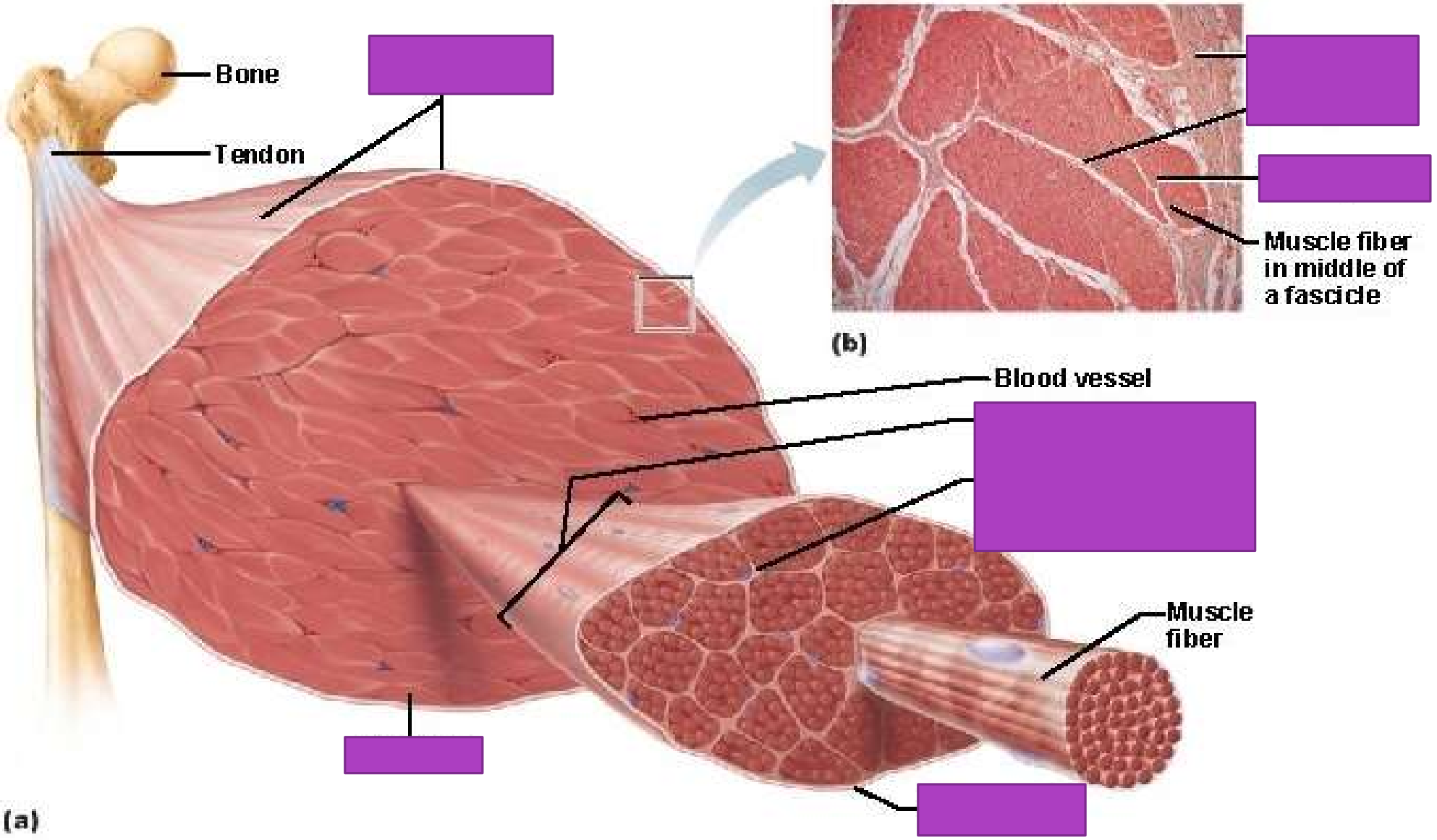
PRINCE GEORGE'S COMMUNITY COLLEGE

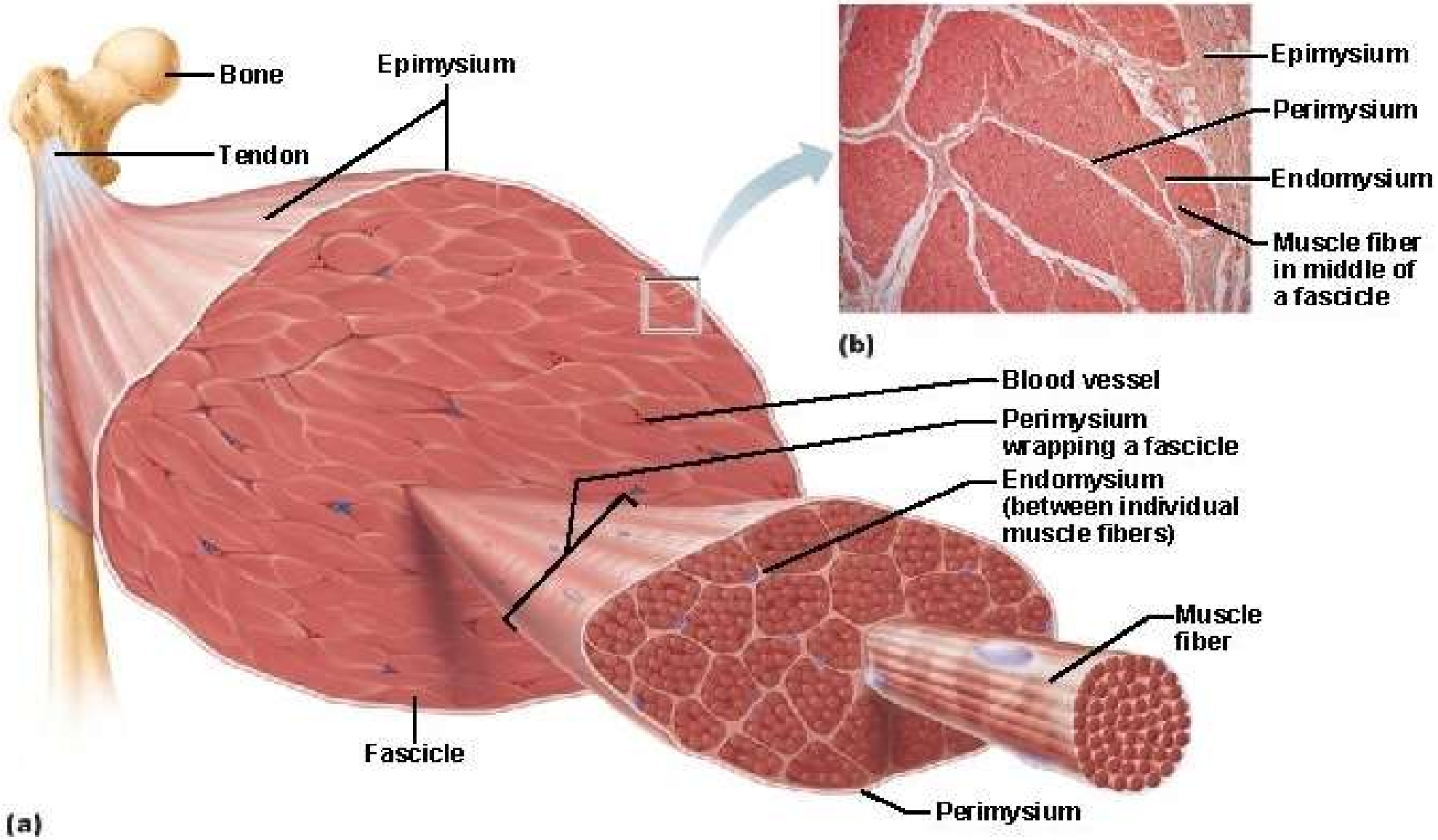
DEFINITION

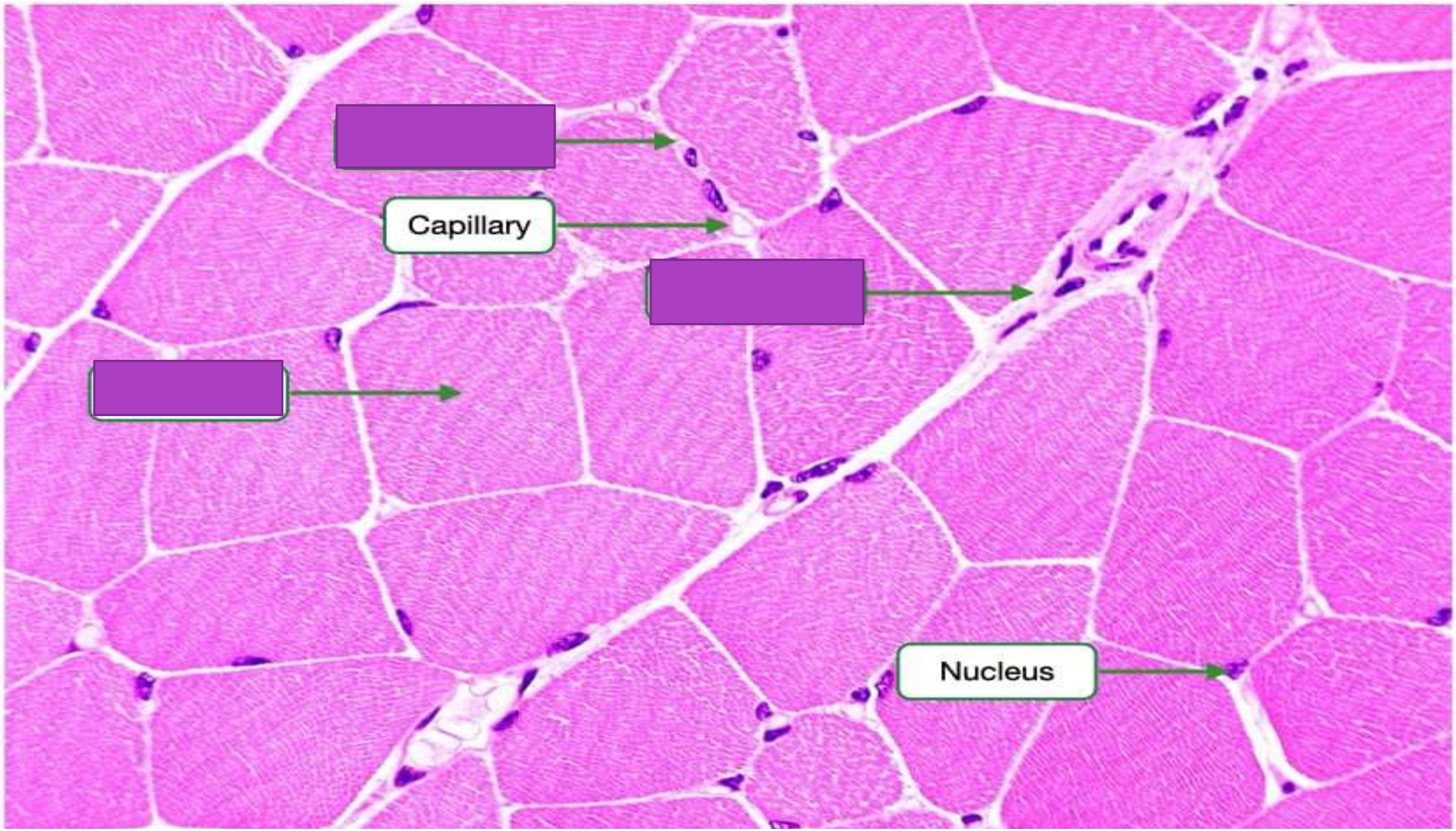
- (1) endomysium—
- (2) perimysium—
- (3) epimysium—

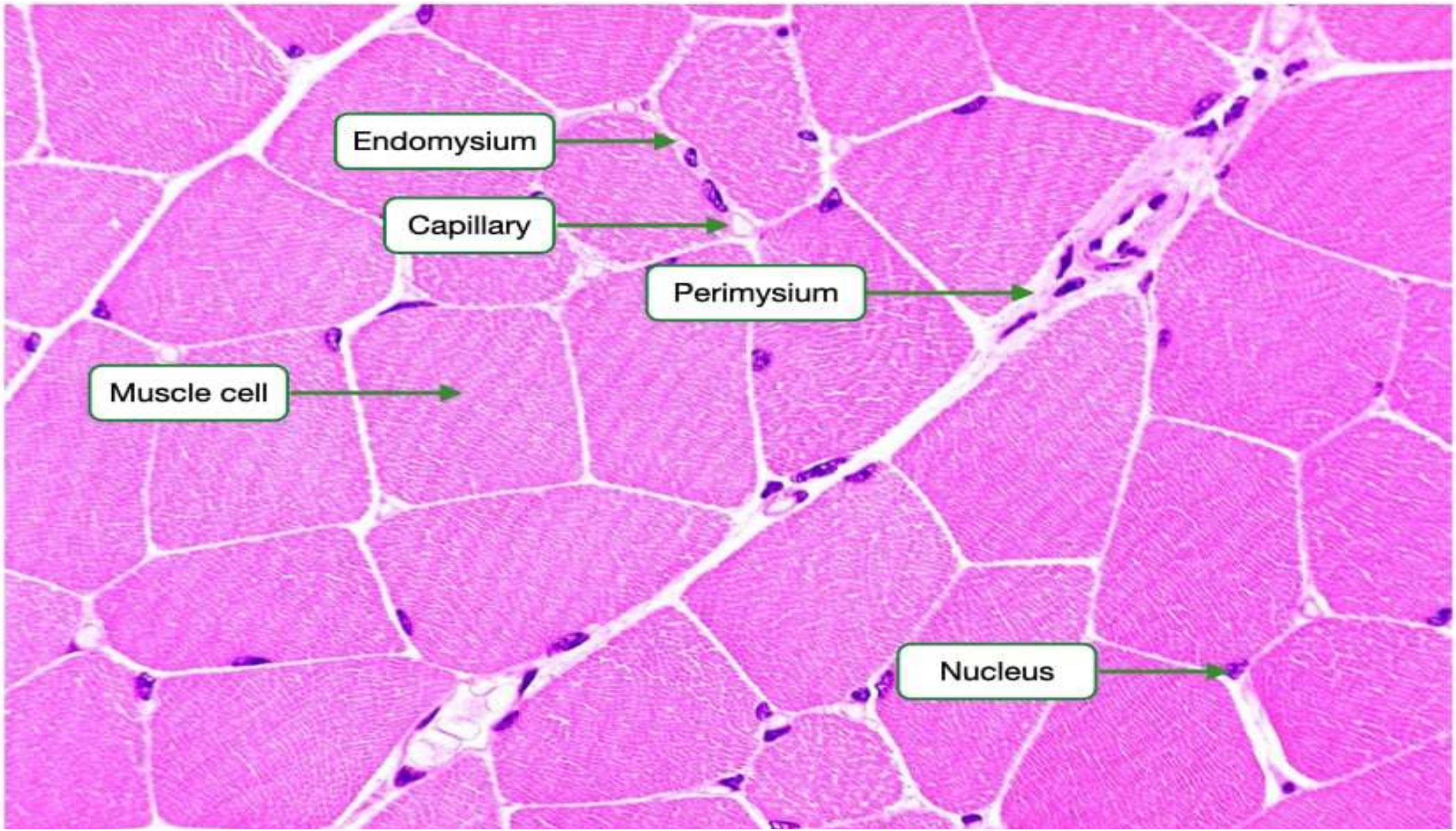
- **(1) endomysium**—connective tissue layer enveloping a single fiber
- **(2) perimysium**—connective tissue layer enveloping a bundle of fibers
- **(3) epimysium**—connective tissue layer enveloping the entire muscle

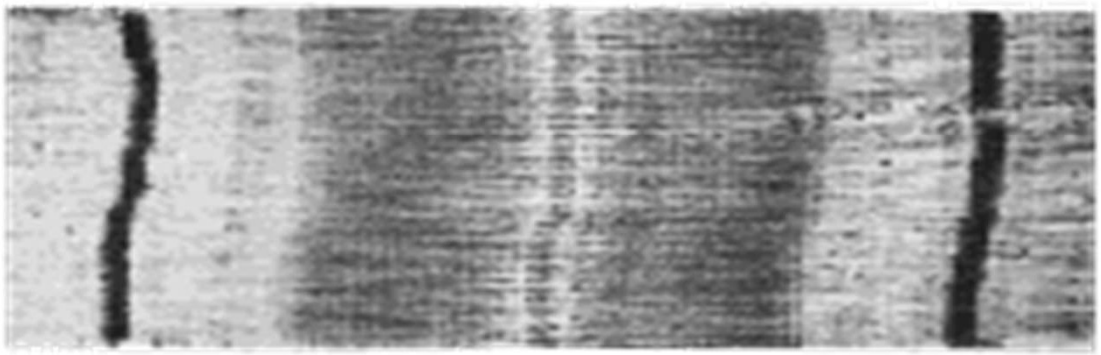


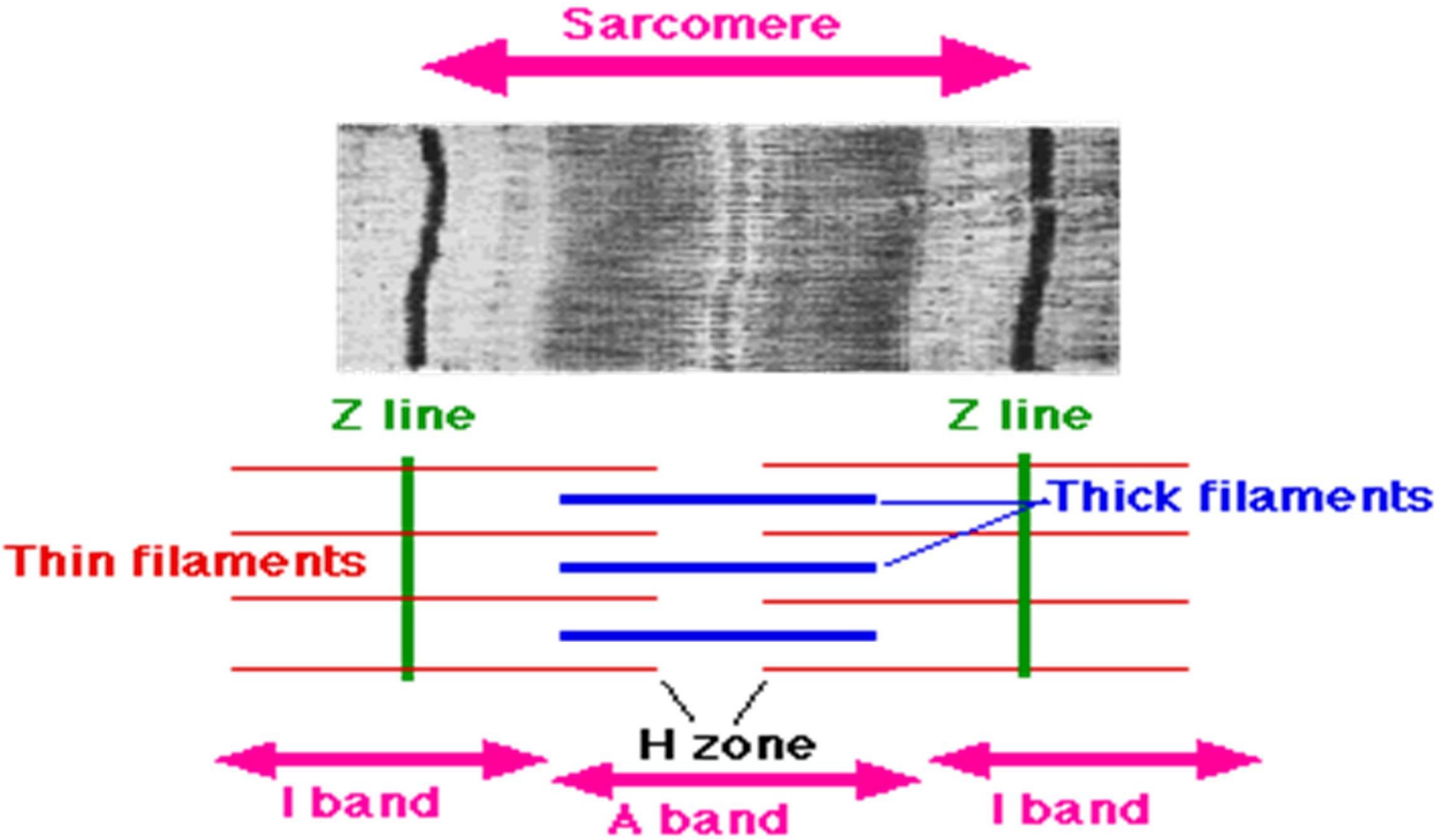

Bone
Tendon
Muscle fiber in middle of a fascicle
(b)
Blood vessel
Muscle fiber
(a)

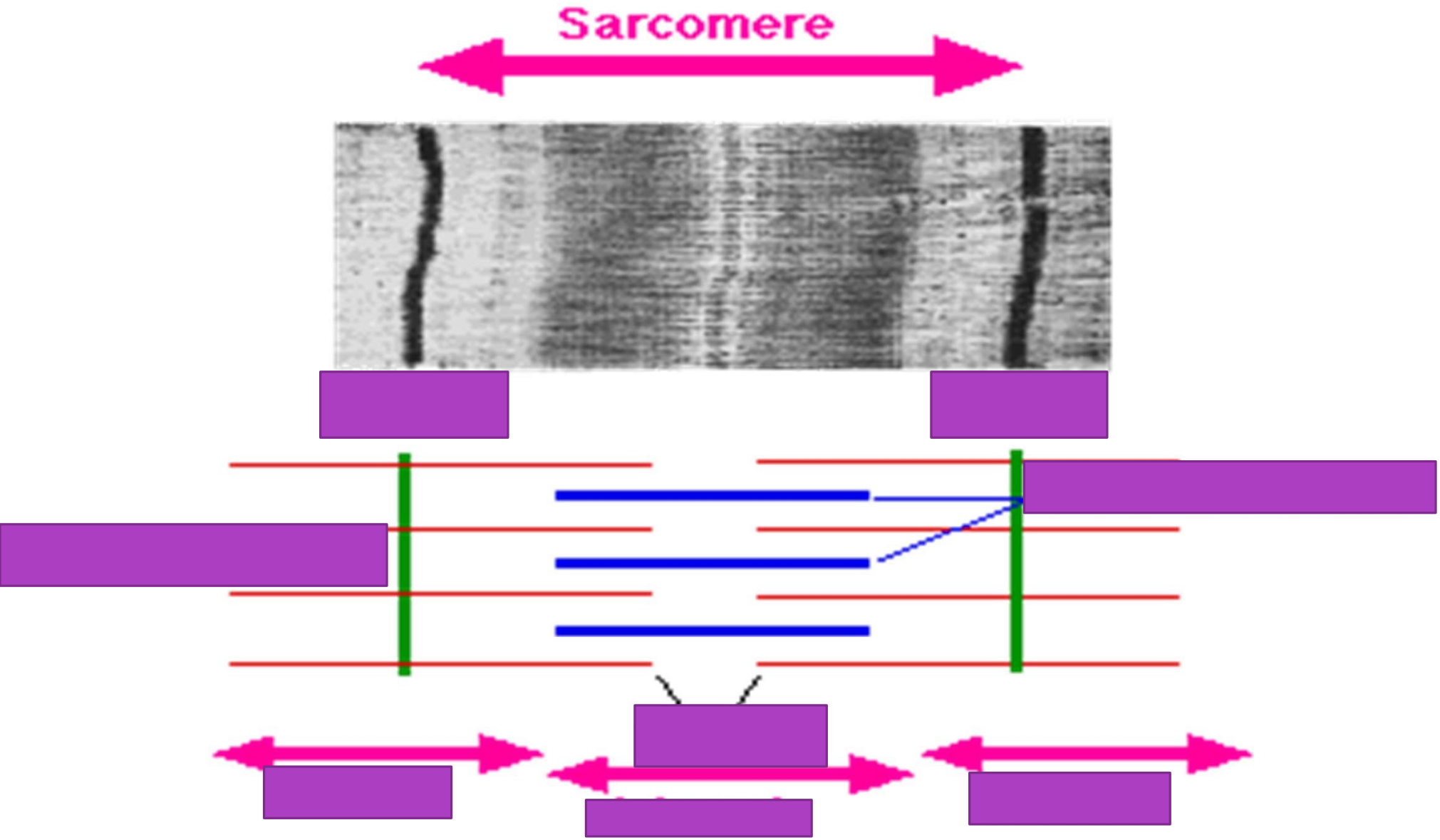

Bone
Tendon
Epimysium
Fascicle
(a)
Epimysium
Perimysium
Endomysium
Muscle fiber in middle of a fascicle
(b)
Blood vessel
Perimysium wrapping a fascicle
Endomysium (between individual muscle fibers)
Muscle fiber
Perimysium

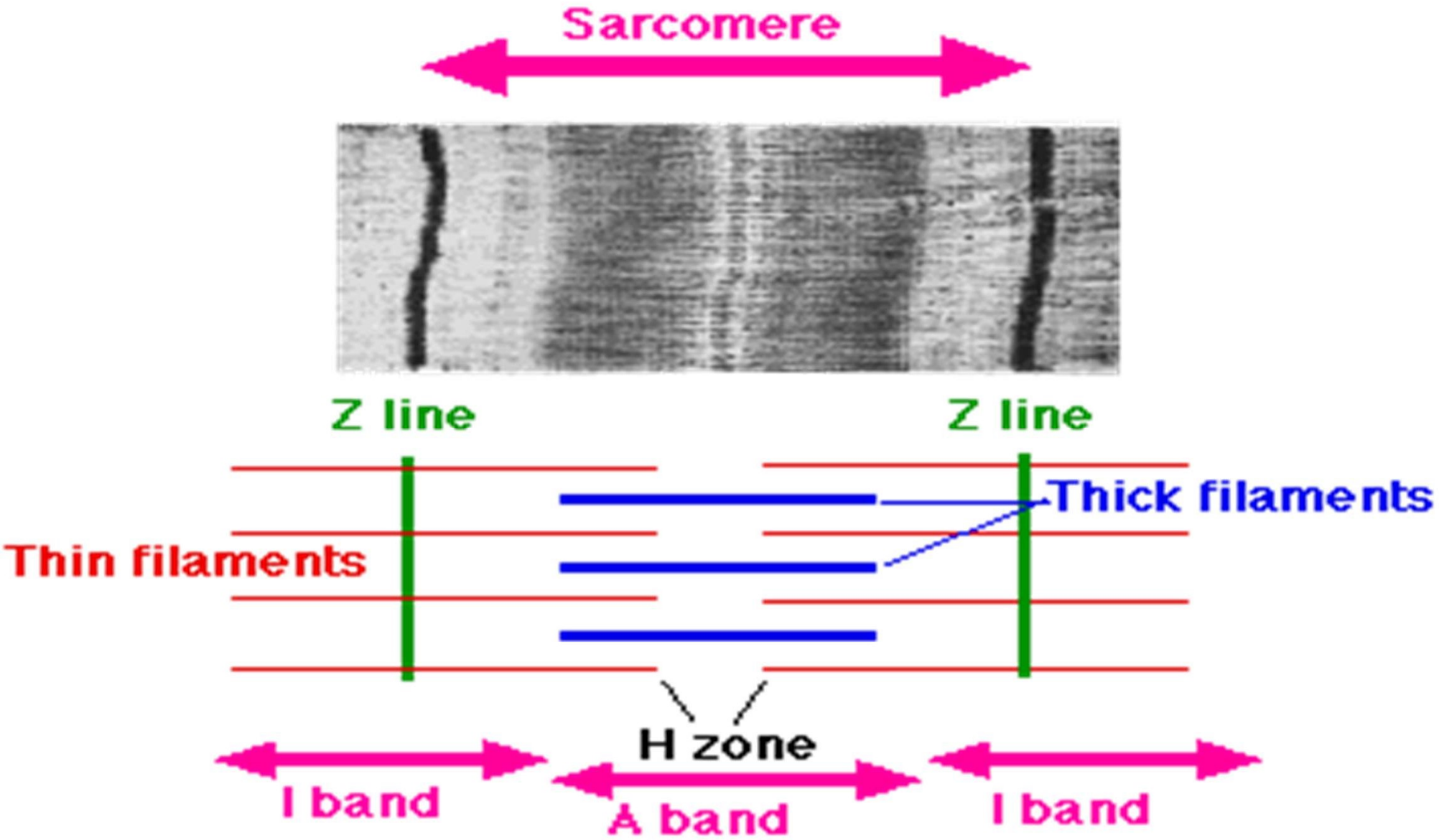

Capillary
Nucleus


Endomysium
Capillary
Perimysium
Muscle cell
Nucleus

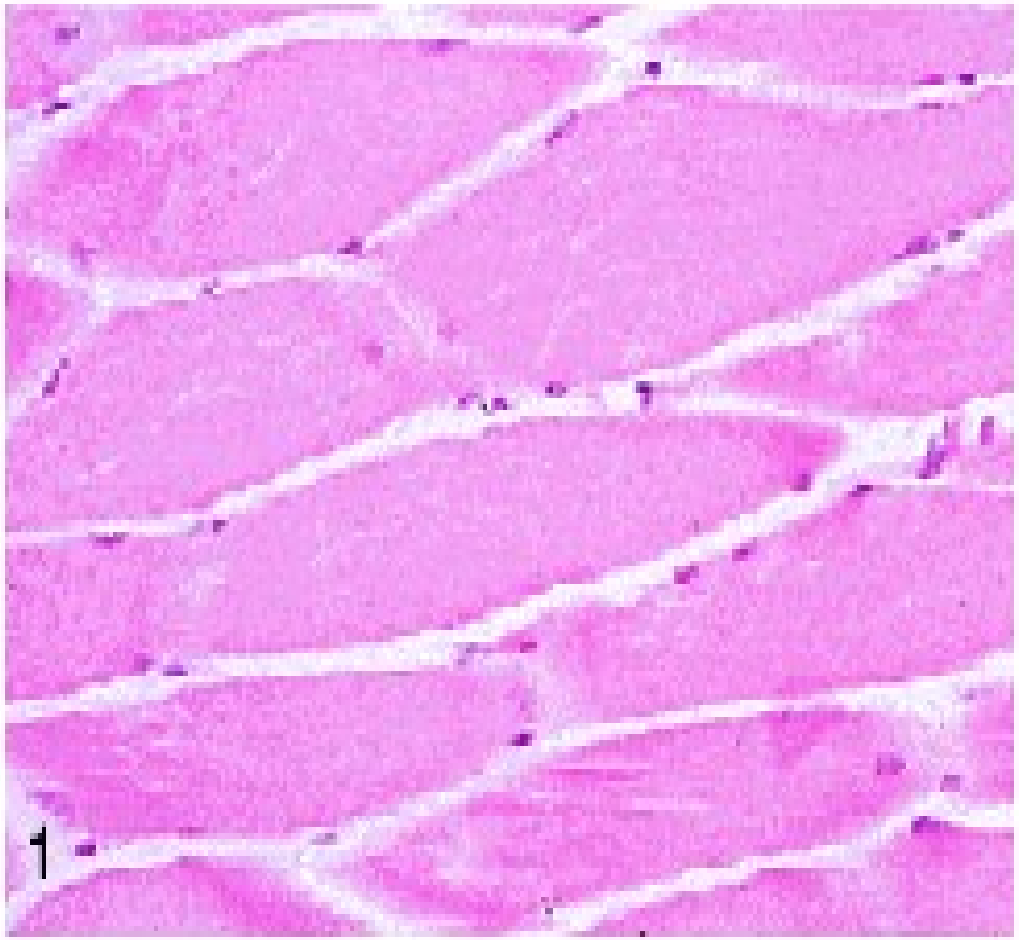



Sarcomere
Z line
Z line
Thick filaments
Thin filaments
H zone
I band
A band
I band

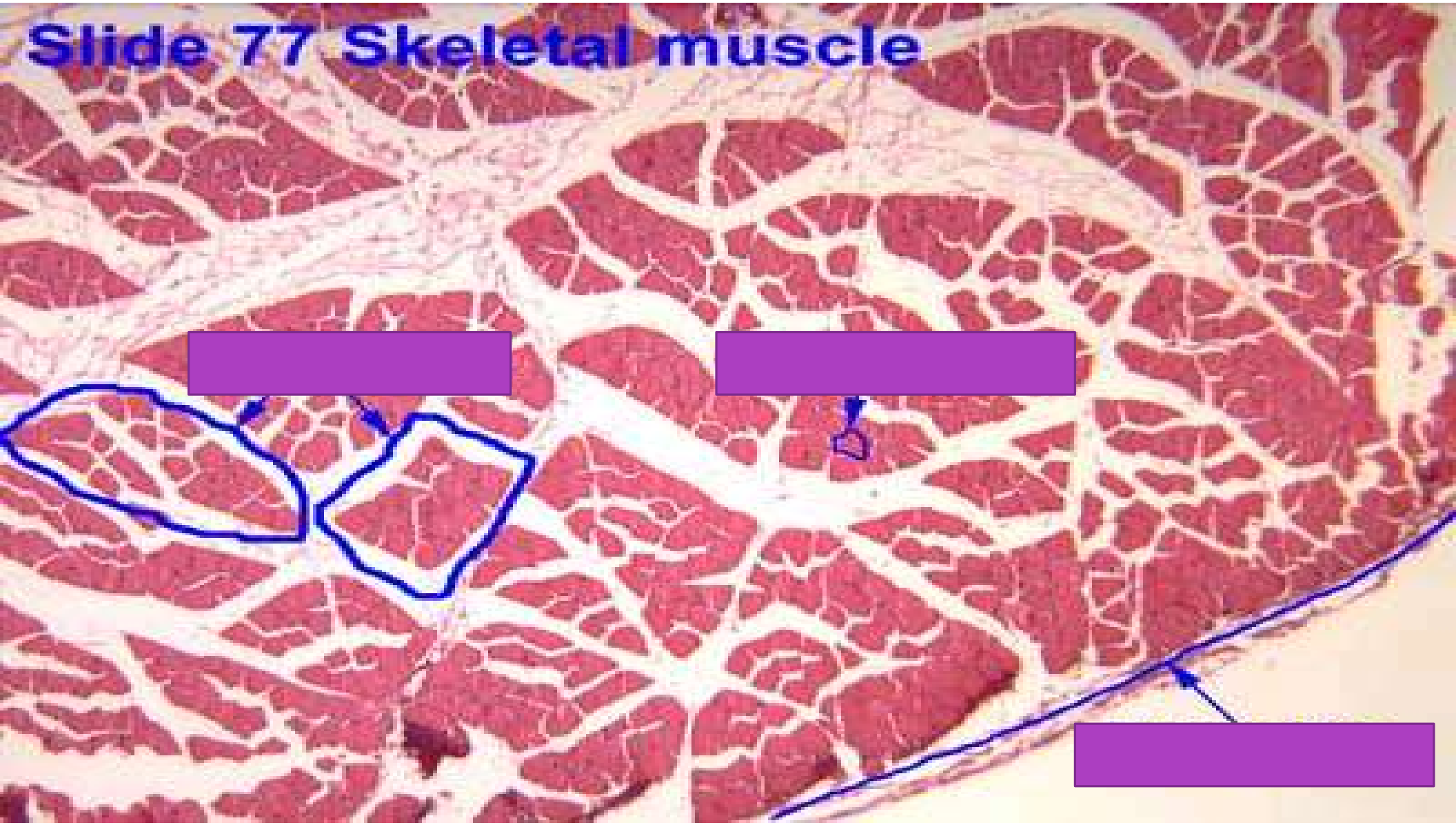

Sarcomere

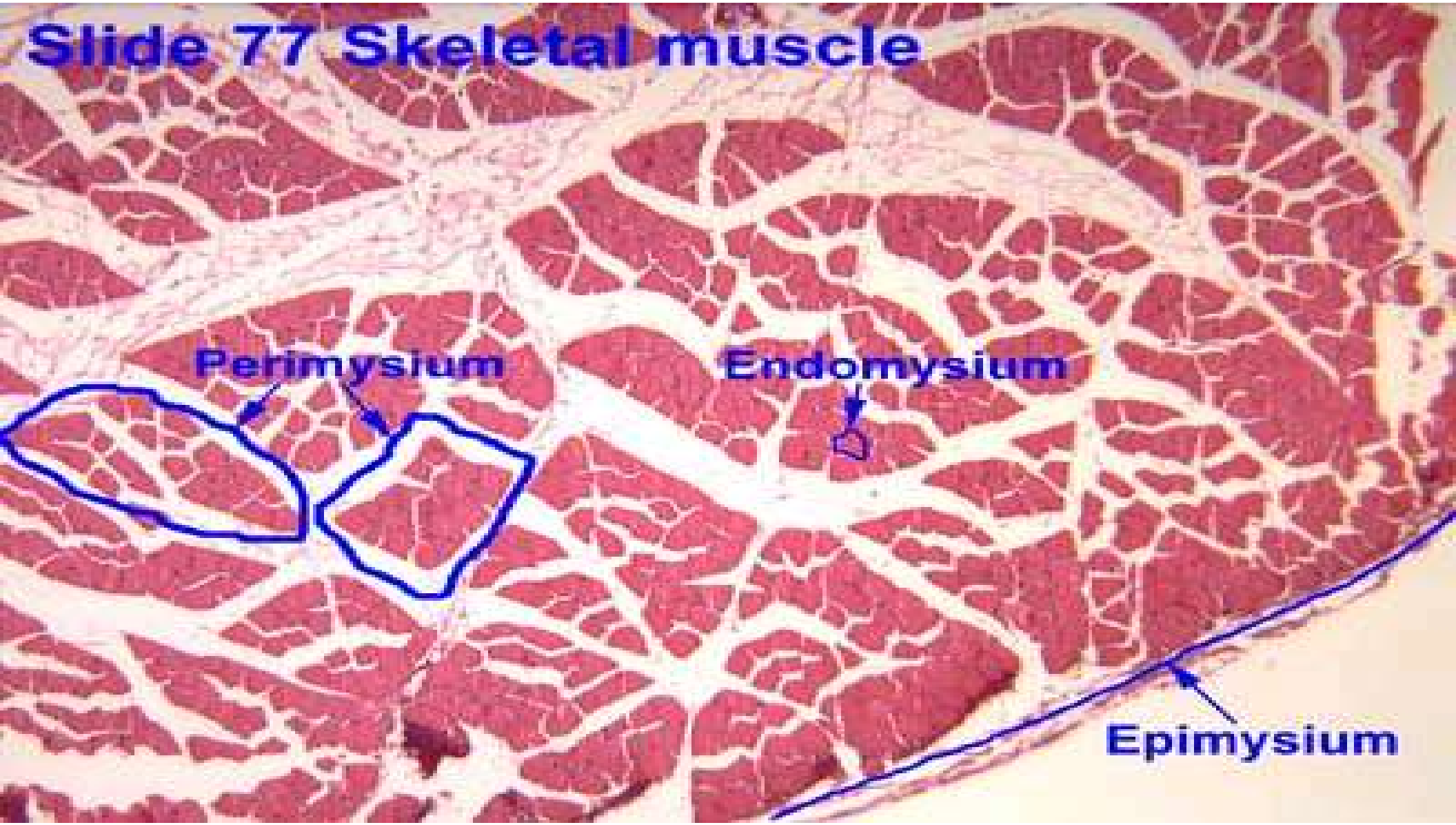

Sarcomere
Z line
Z line
Thick filaments
Thin filaments
H zone
I band
A band
I band

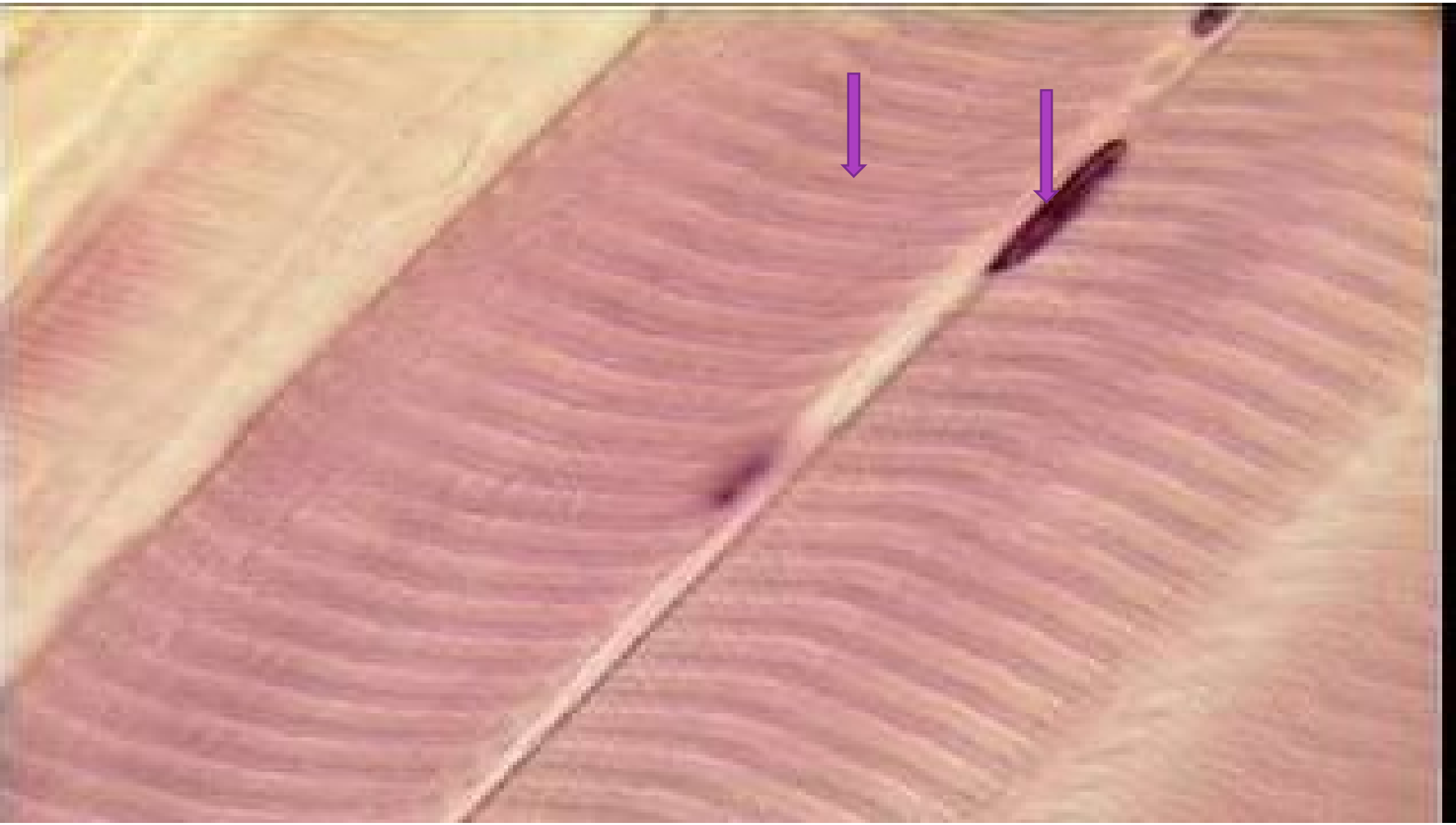
WHAT TYPE OF MUSCLE TISSUE?

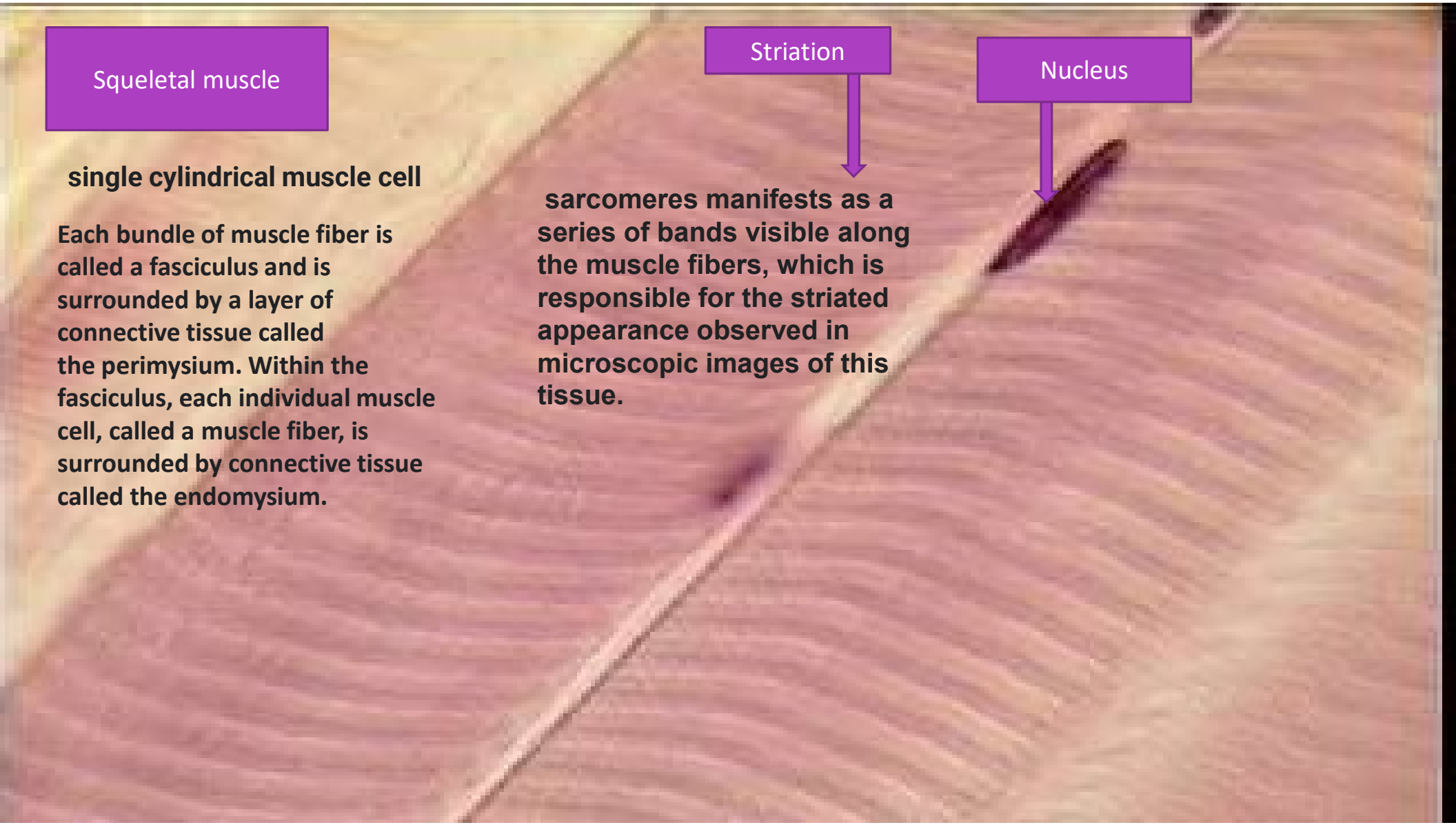


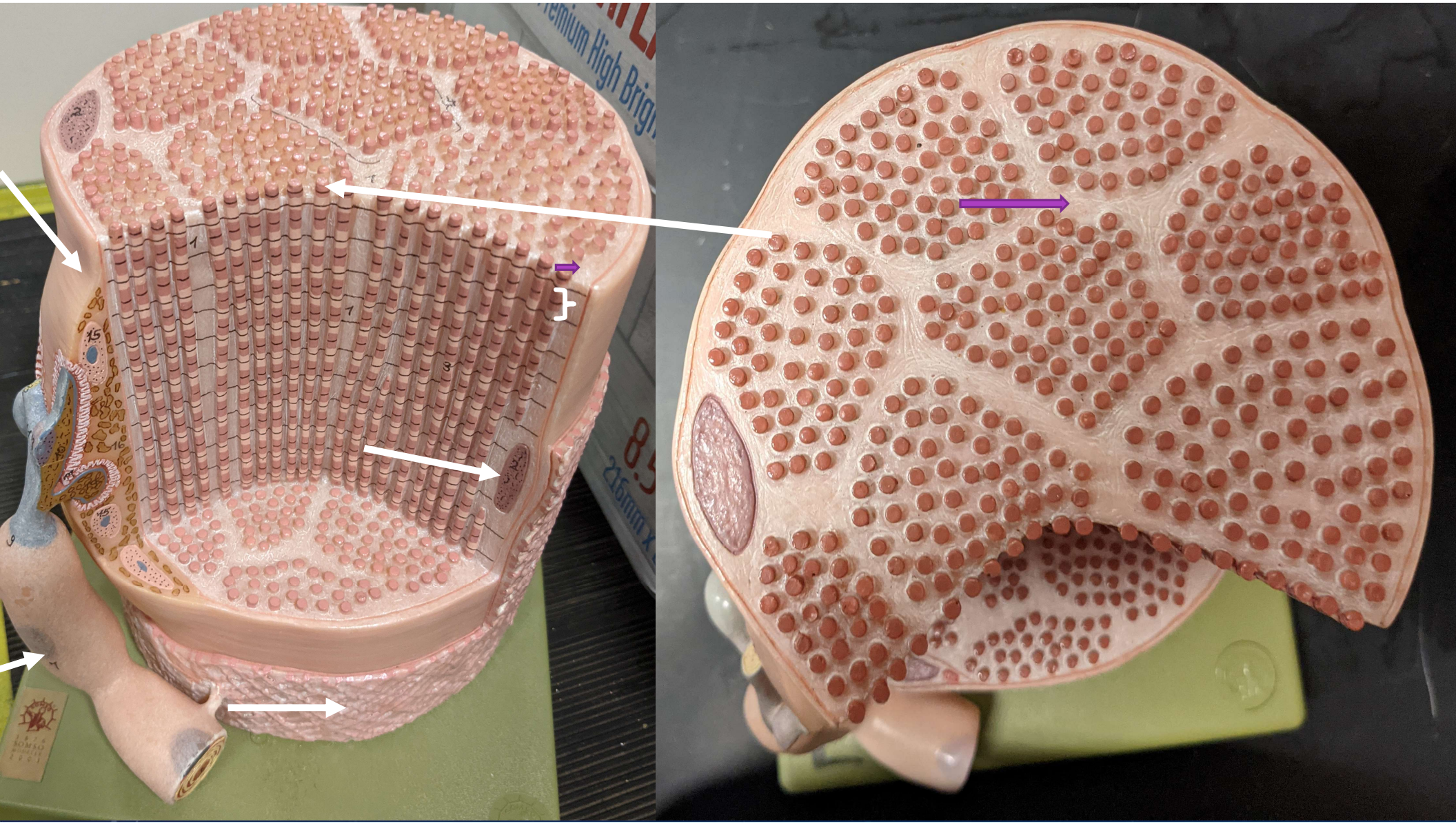
Skeletal Muscle


Slide 77 Skeletal muscle

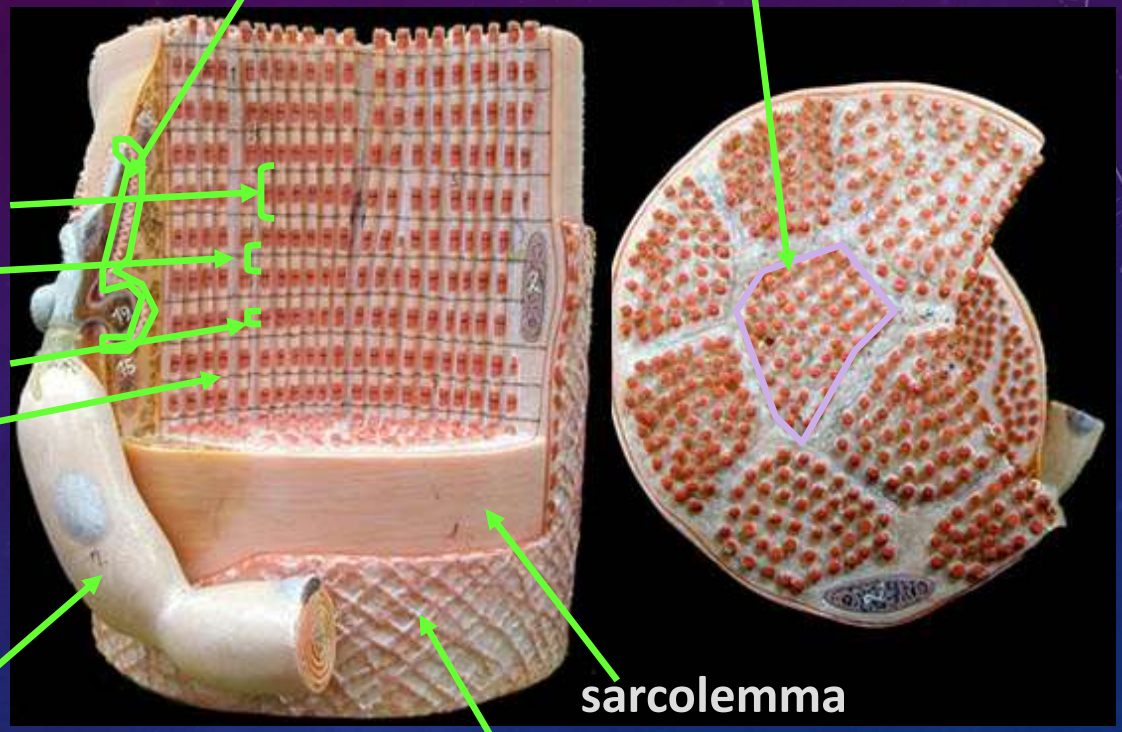

Slide 77 Skeletal muscle
Perimysium
Endomysium
Epimysium

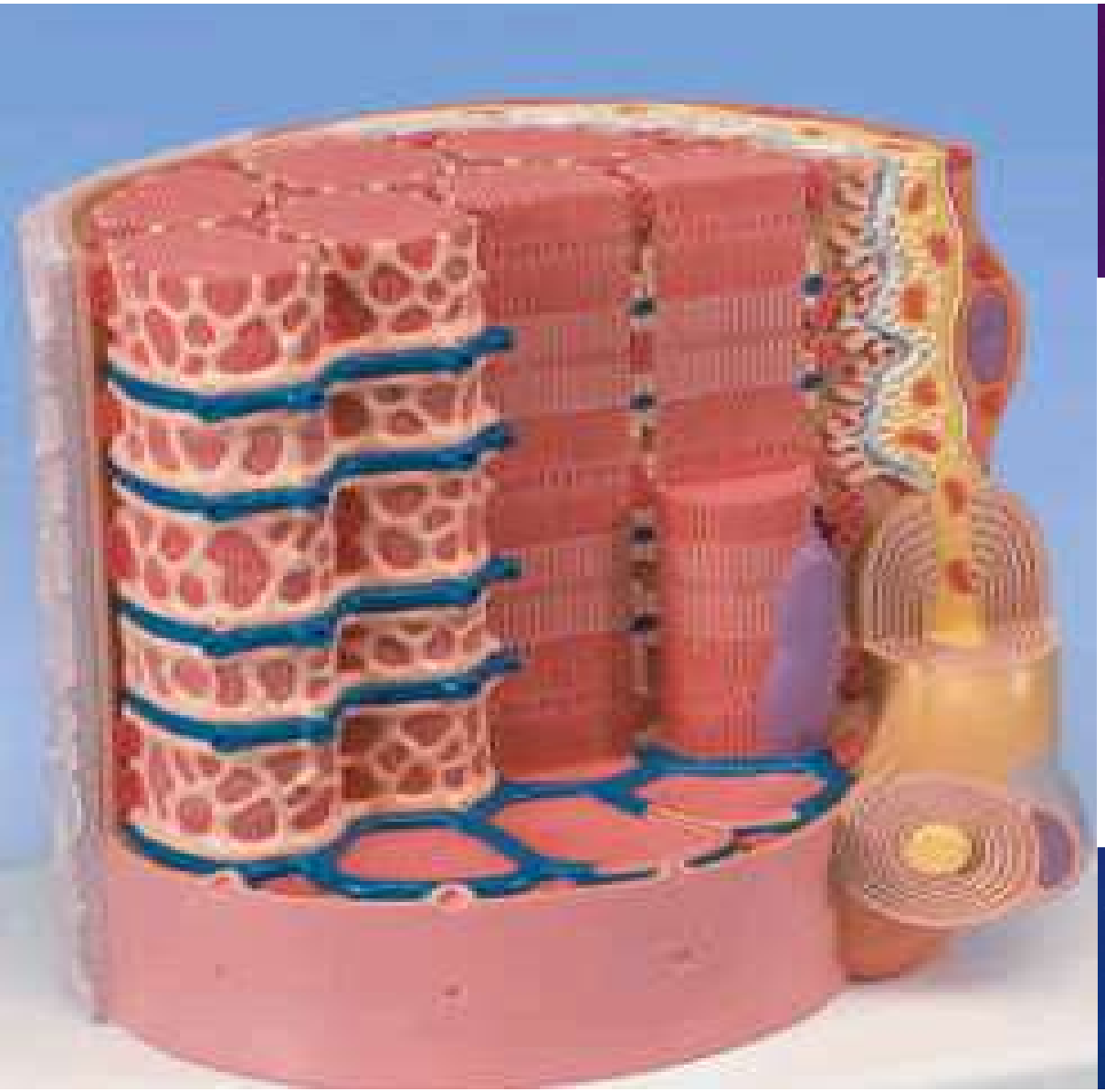


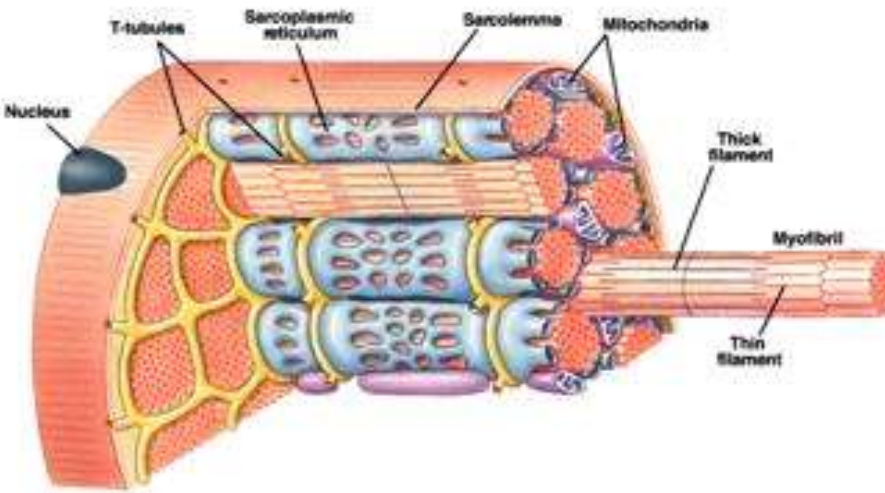

Squeletal muscle
Striation
Nucleus
single cylindrical muscle cell
Each bundle of muscle fiber is called a fasciculus and is surrounded by a layer of connective tissue called the perimysium. Within the fasciculus, each individual muscle cell, called a muscle fiber, is surrounded by connective tissue called the endomysium.
sarcomeres manifests as a series of bands visible along the muscle fibers, which is responsible for the striated appearance observed in microscopic images of this tissue.

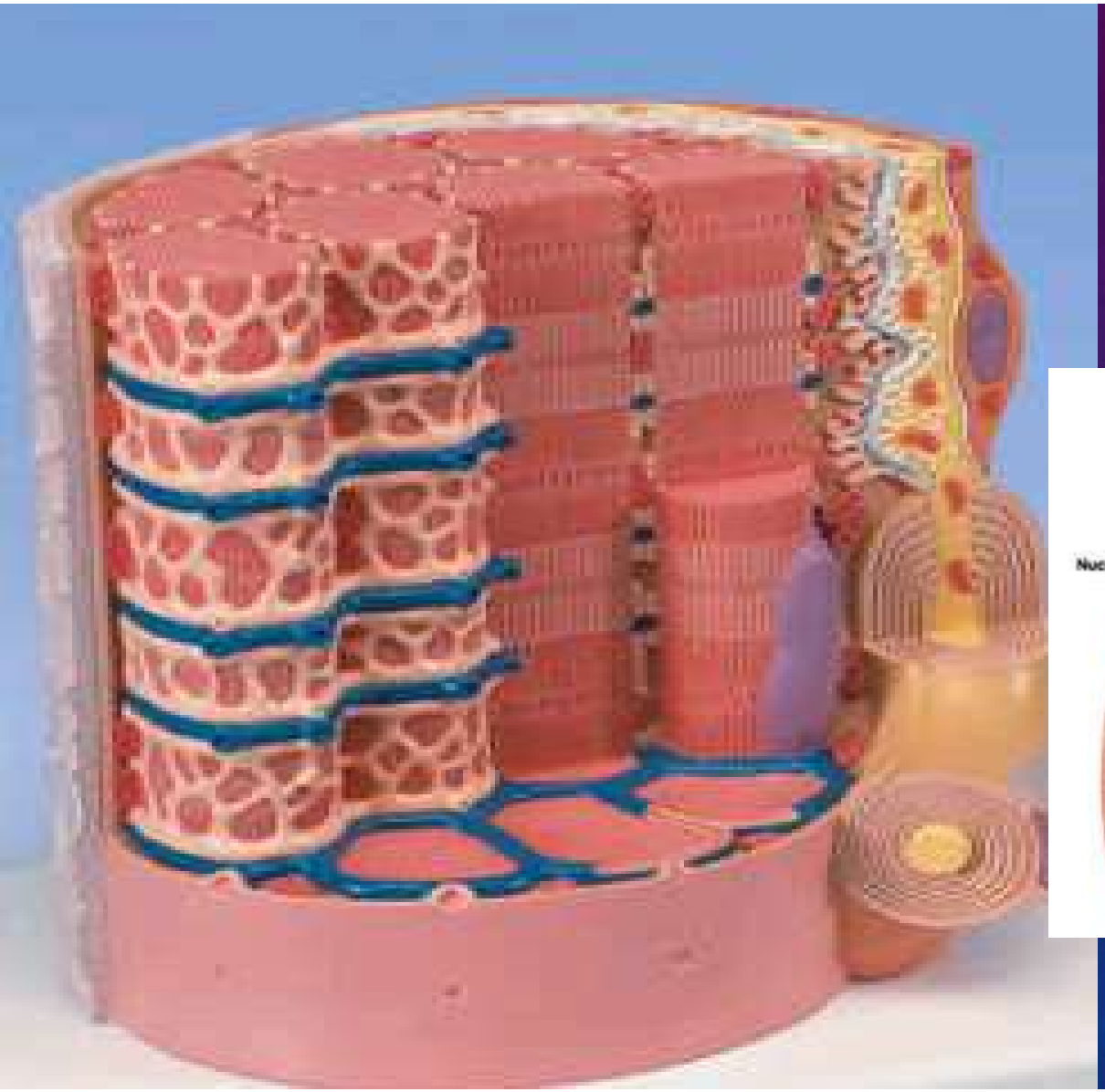


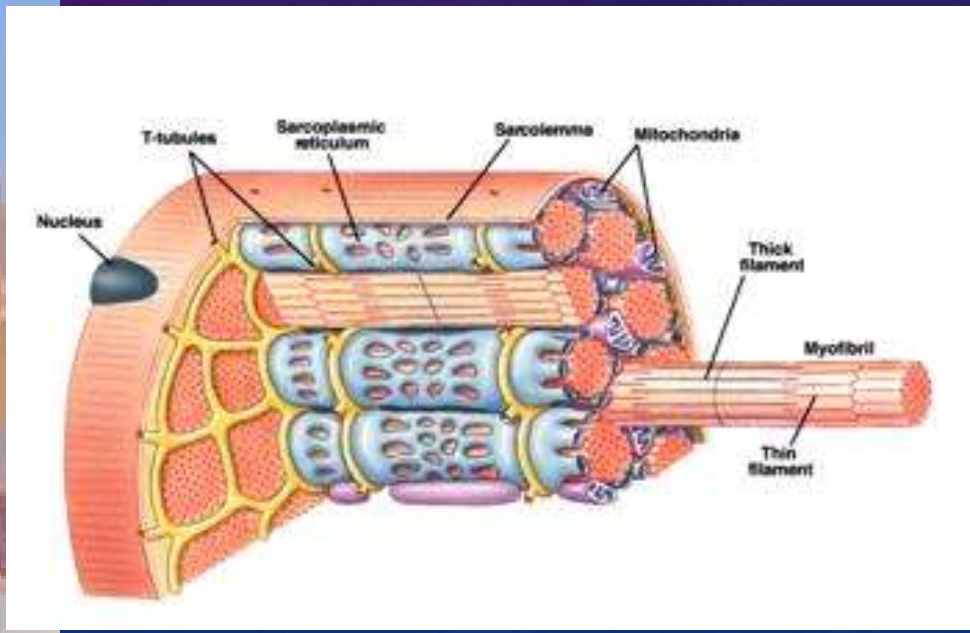
MUSCLE FIBER/NERVE TERMINAL






T-tubules
Sarcoplasmic reticulum
Sarcolemma
Mitochondria
Nucleus
Thick filament
Myofibril
Thin filament




T-tubules
Sarcoplasmic reticulum
Sarcolemma
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Myofibril
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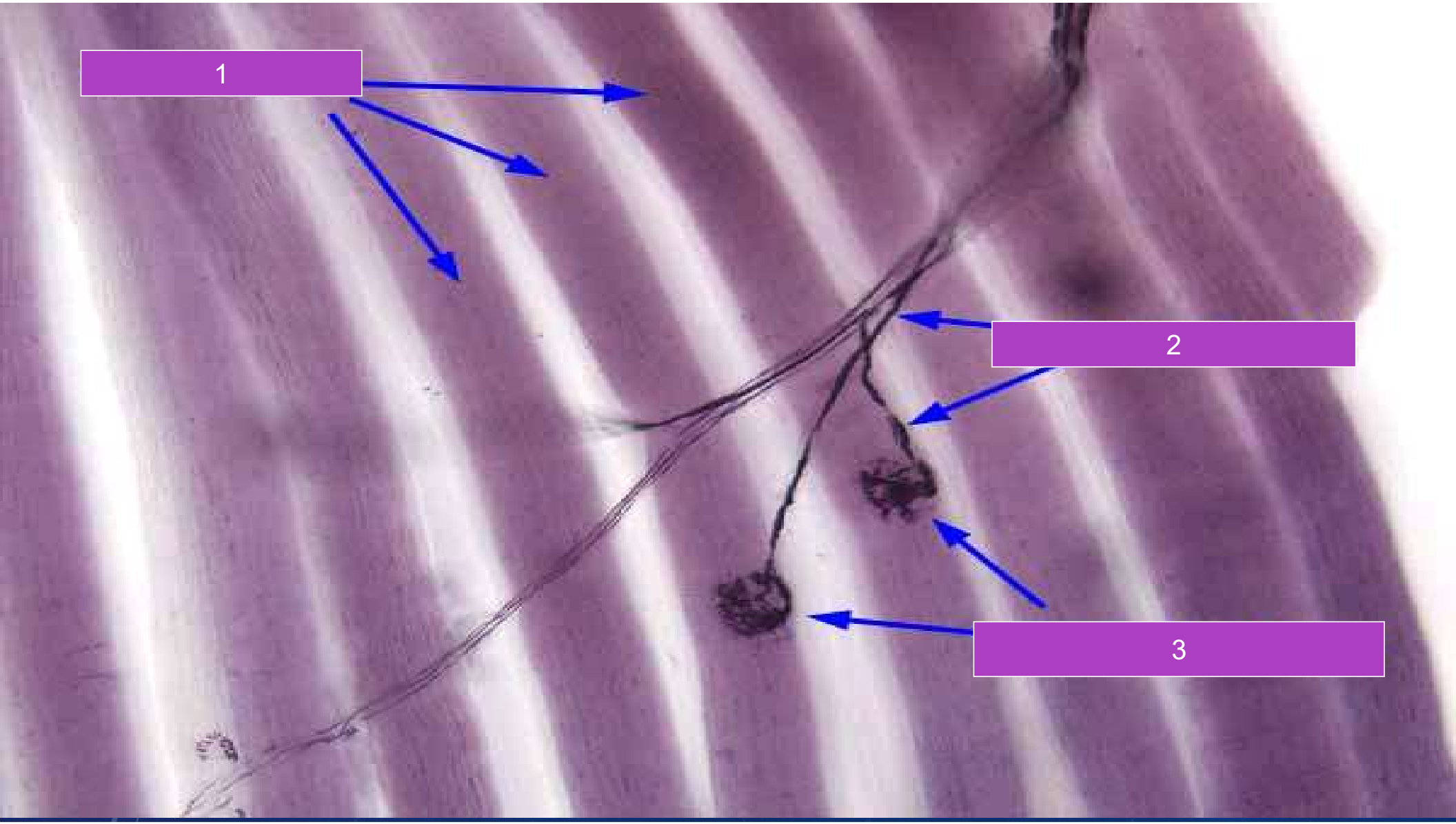
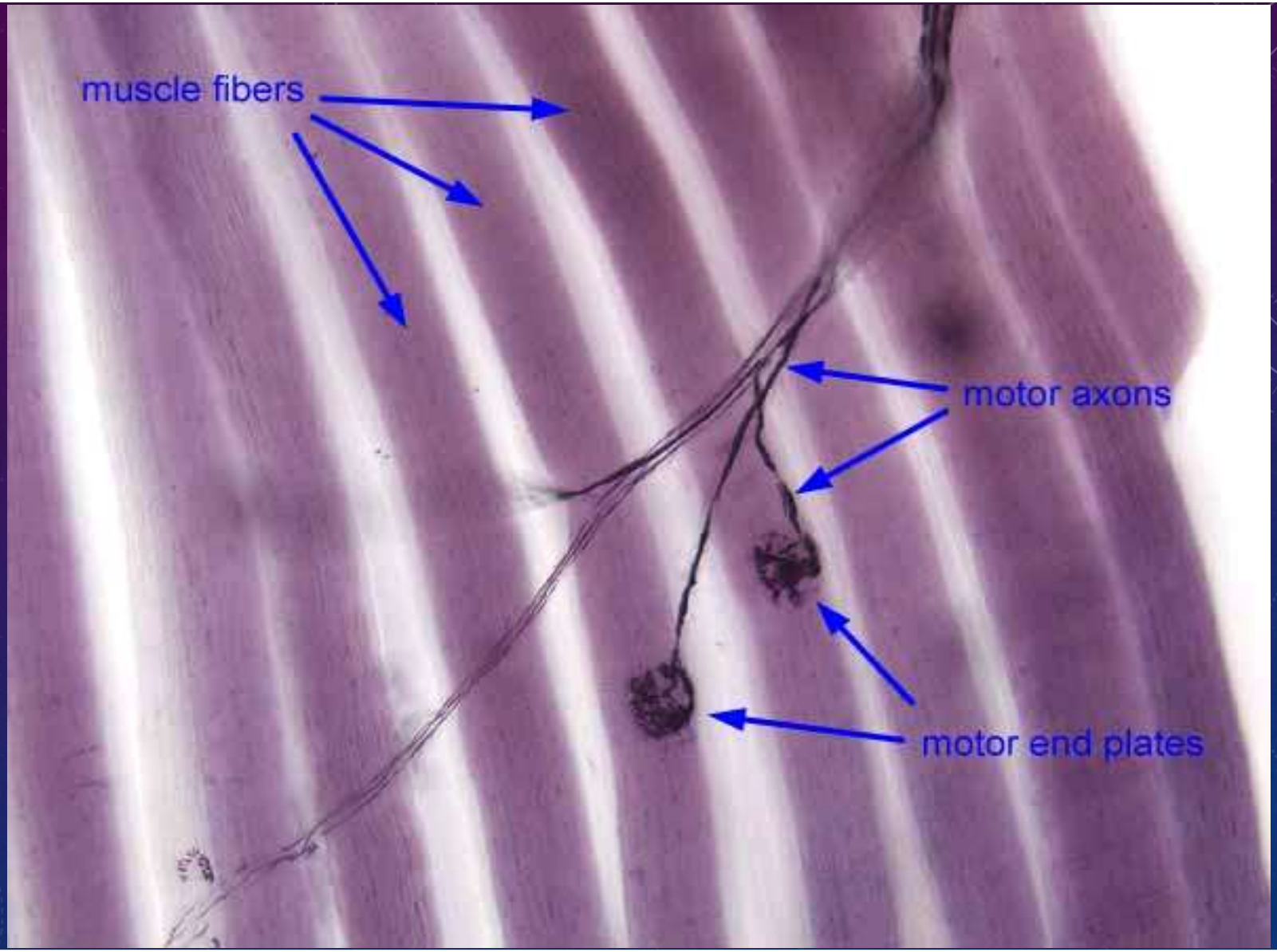
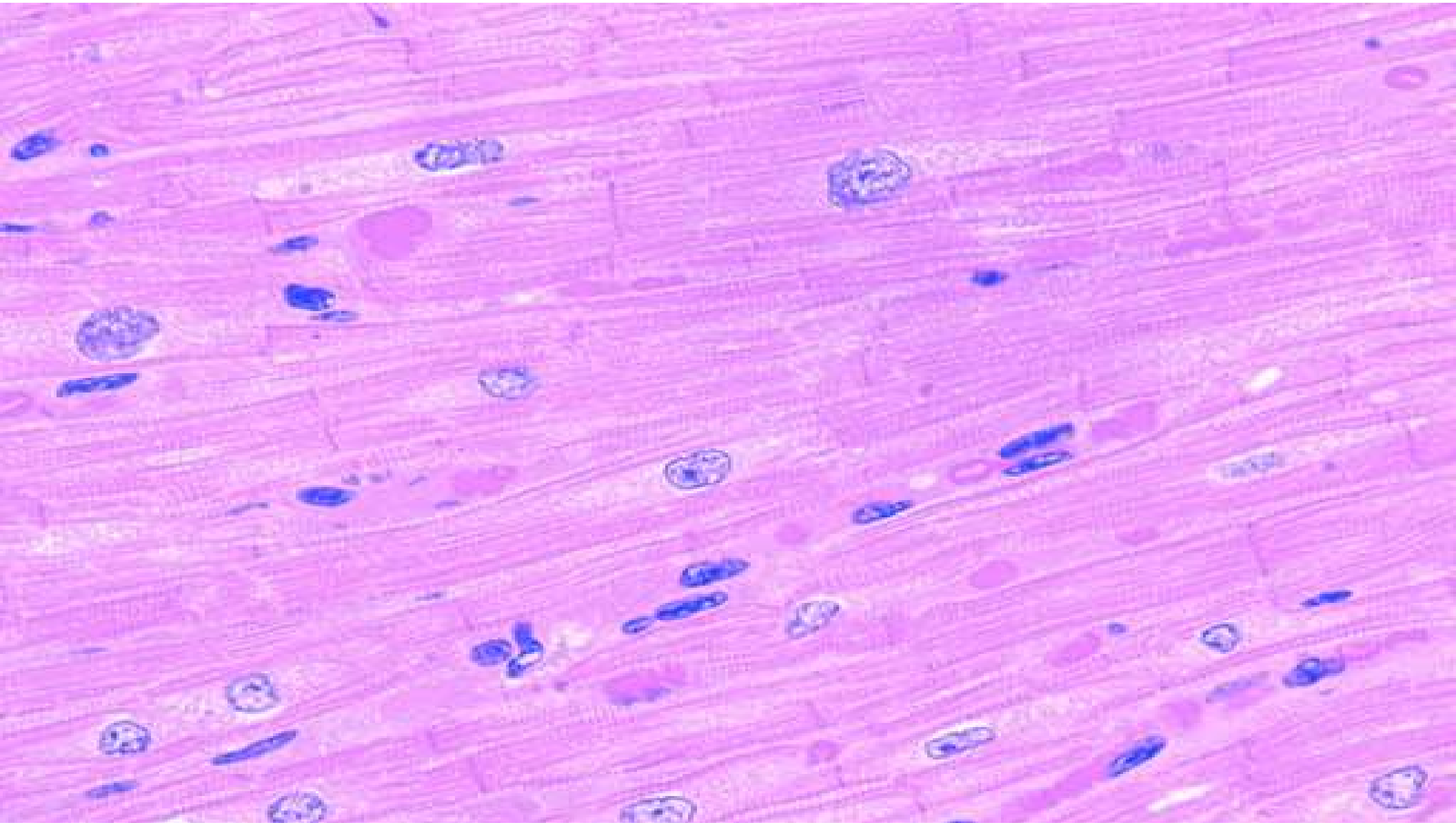
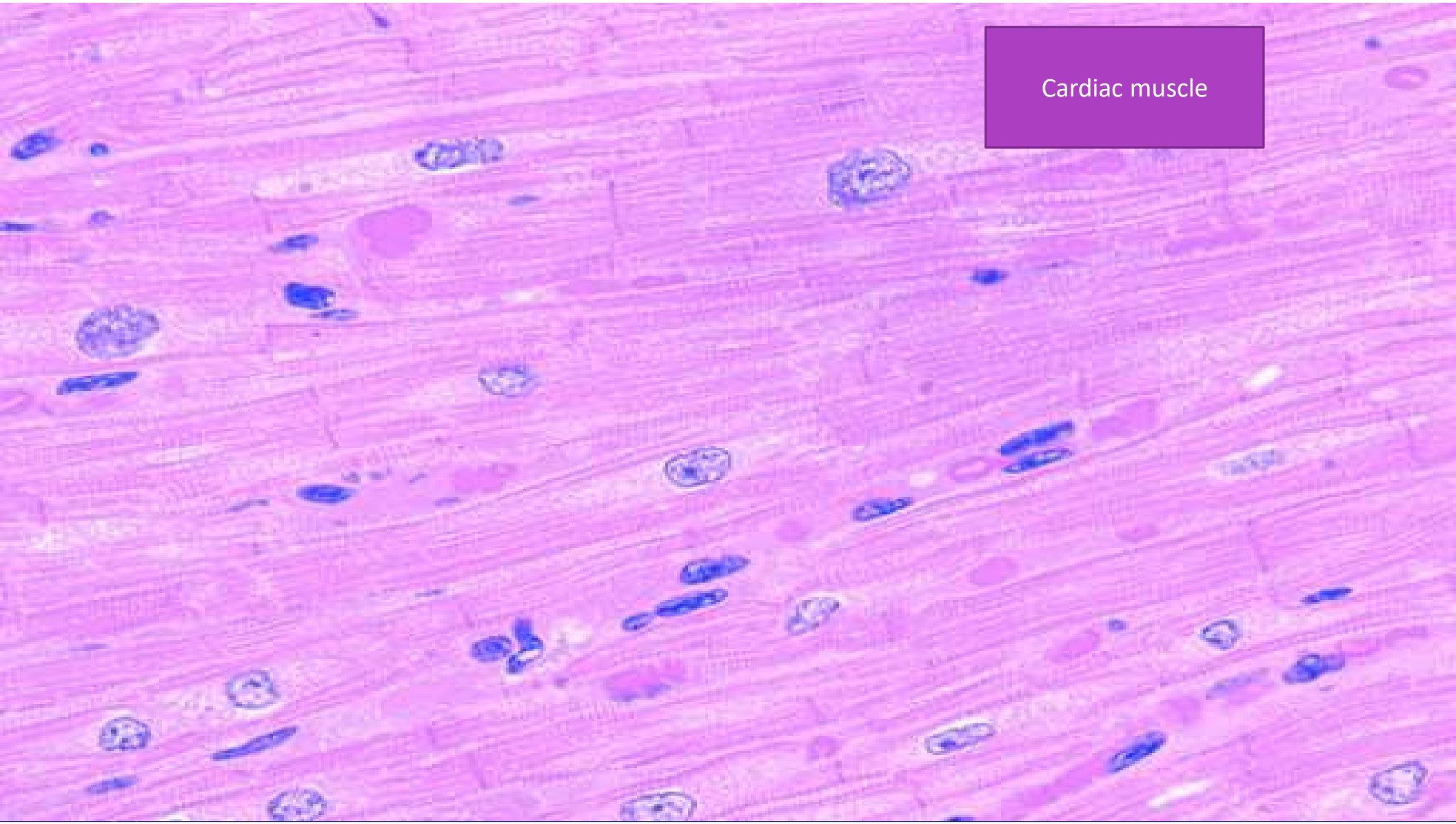
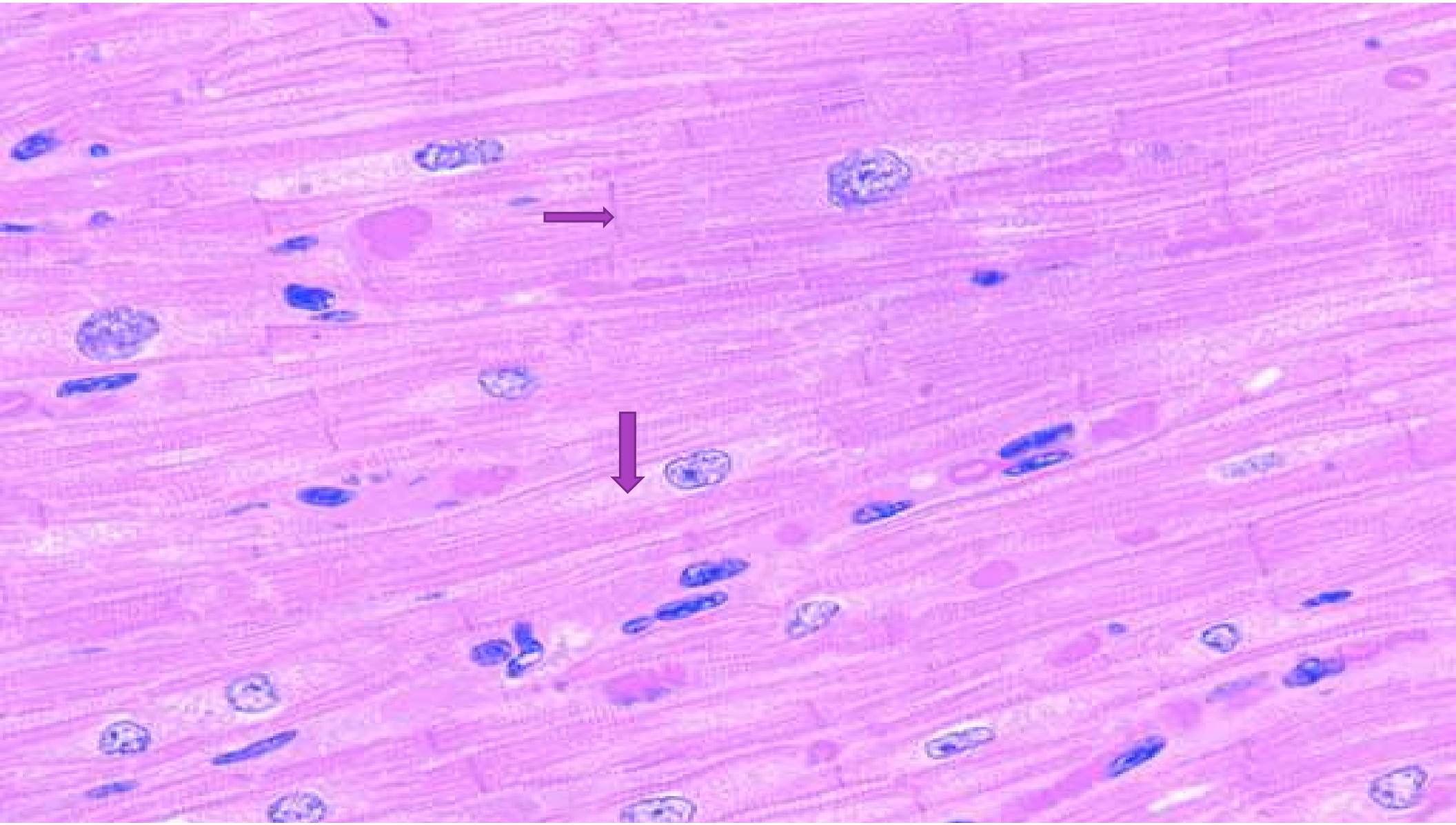

1
2
3


muscle fibers
motor axons
motor end plates



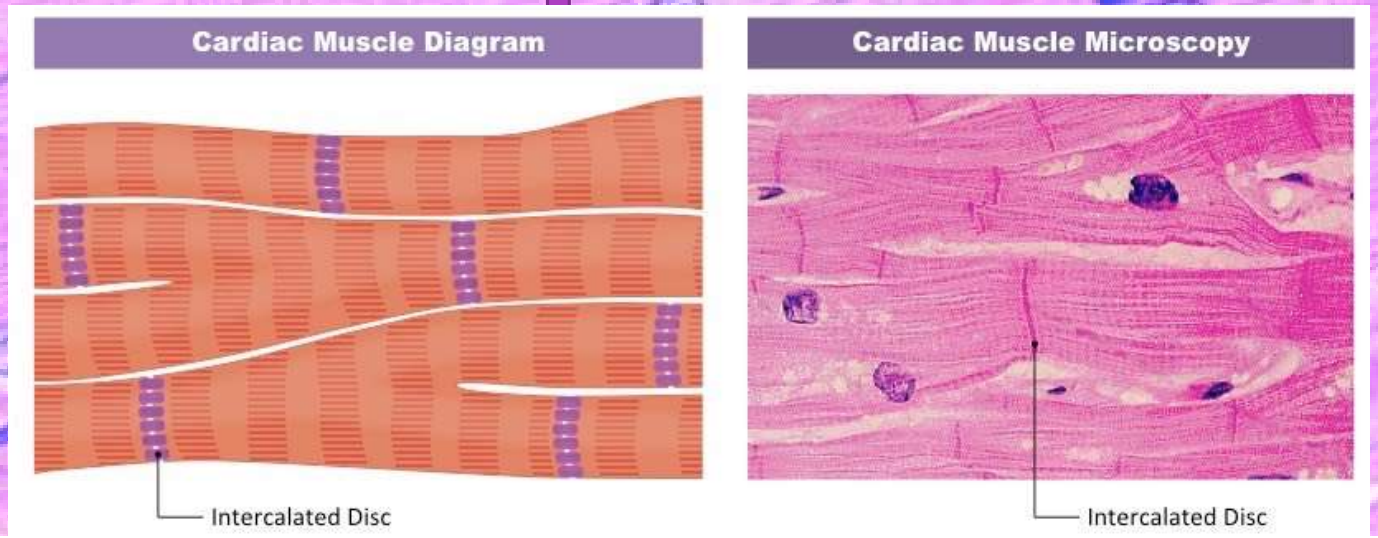

Cardiac muscle

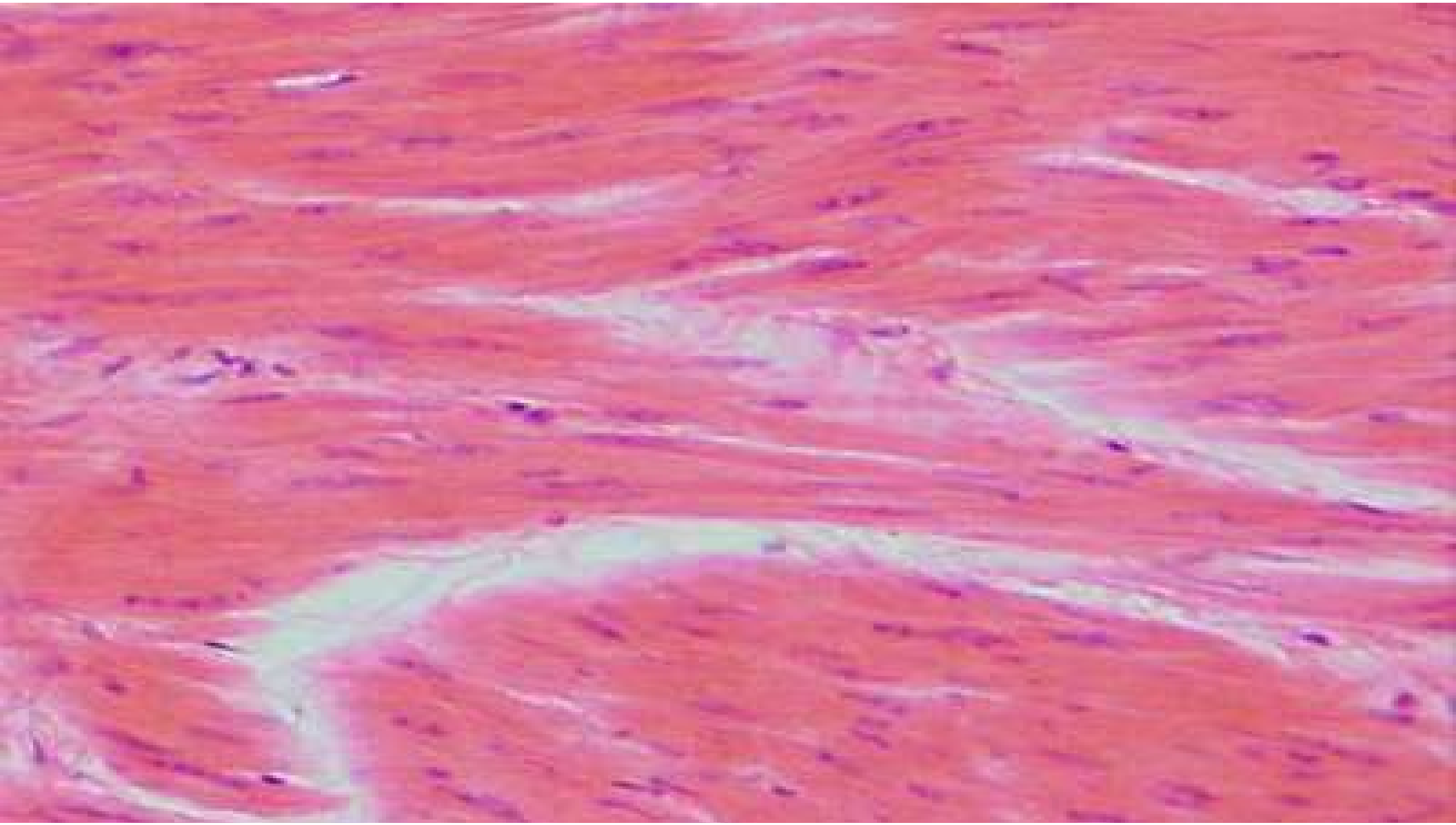


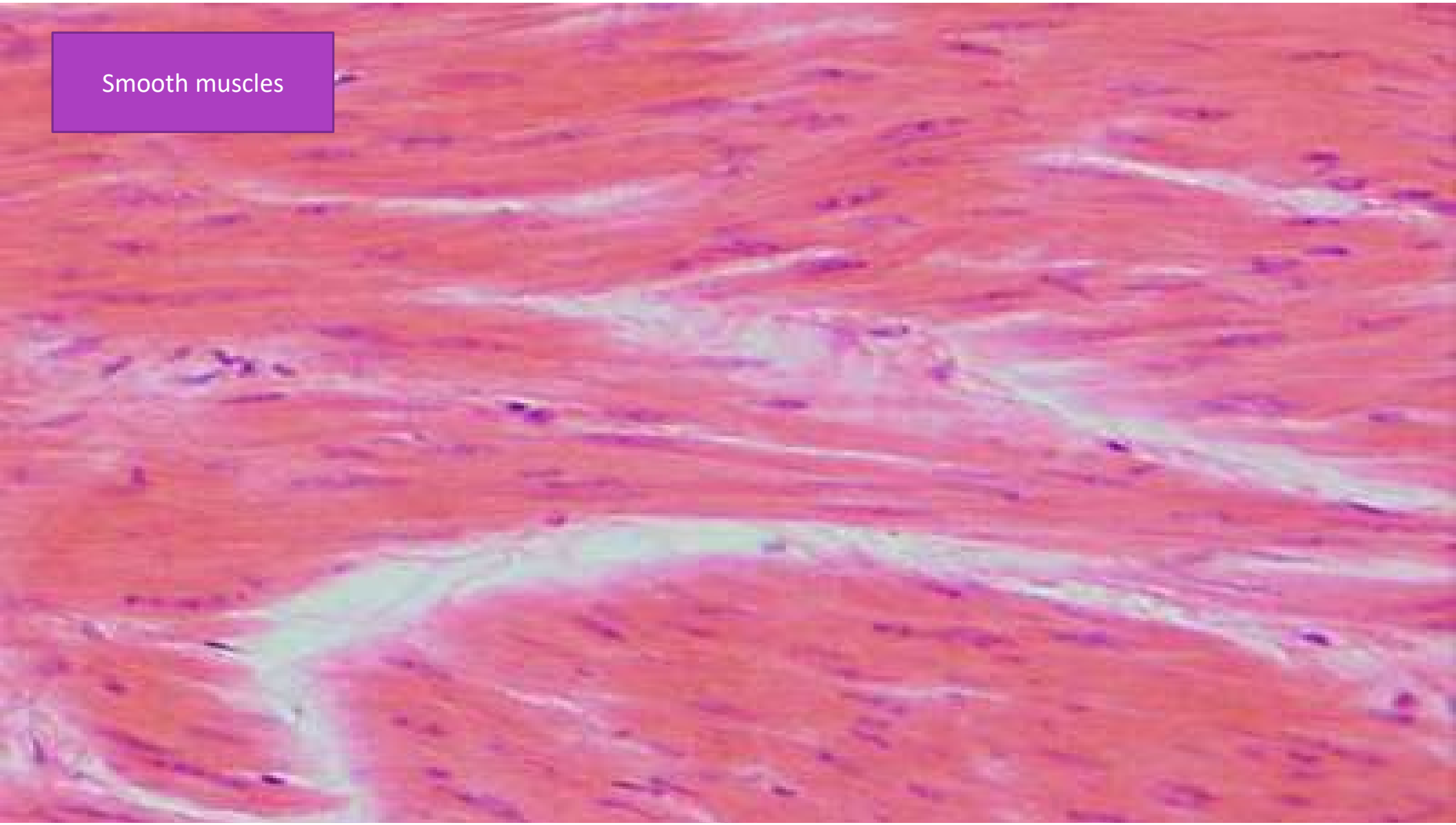
Intercalated discs support synchronized contraction of cardiac tissue.
They occur at the Z line of the sarcomere and can be visualized easily when observing a longitudinal section of the tissue.

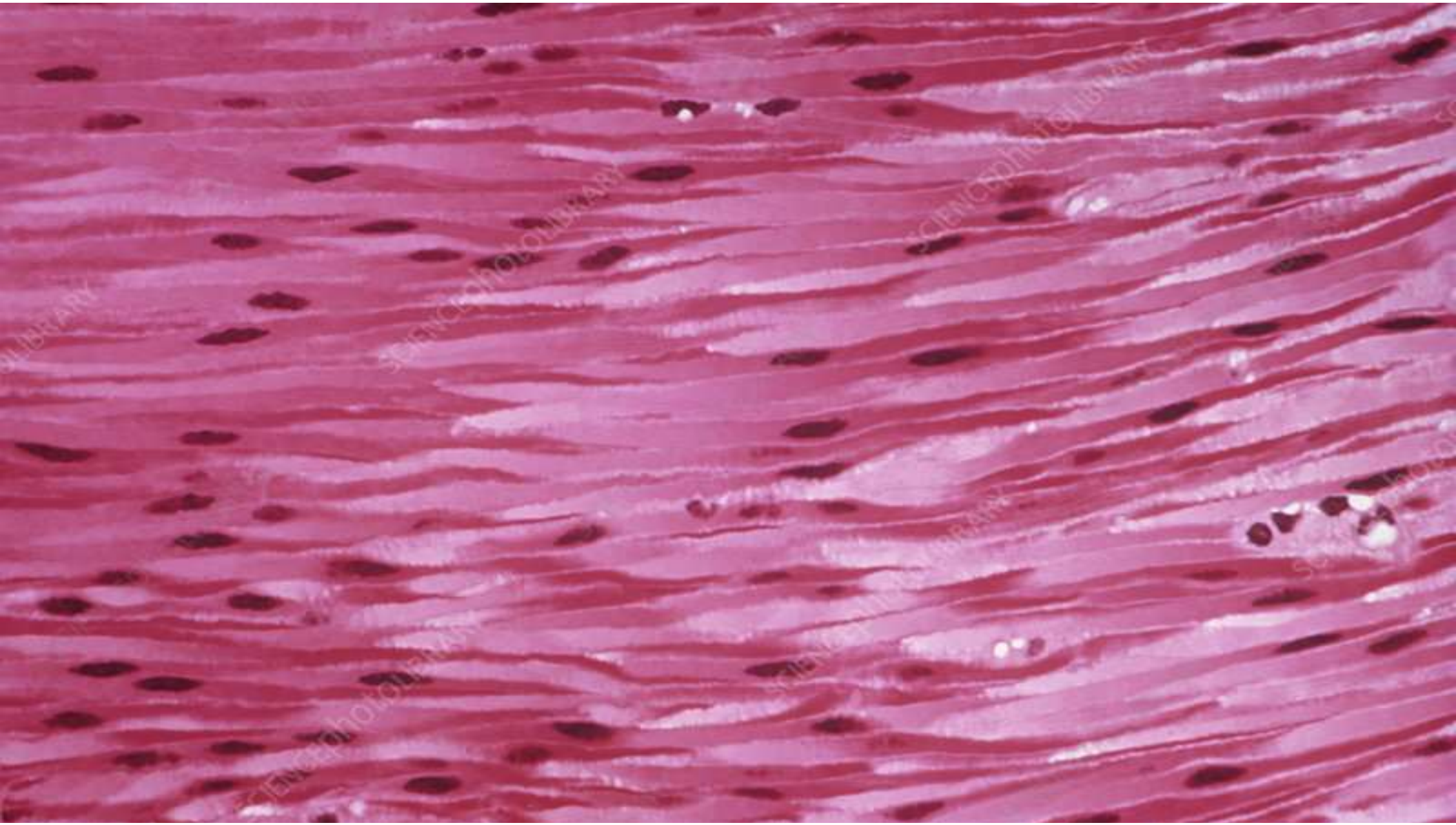
Intercalated disc

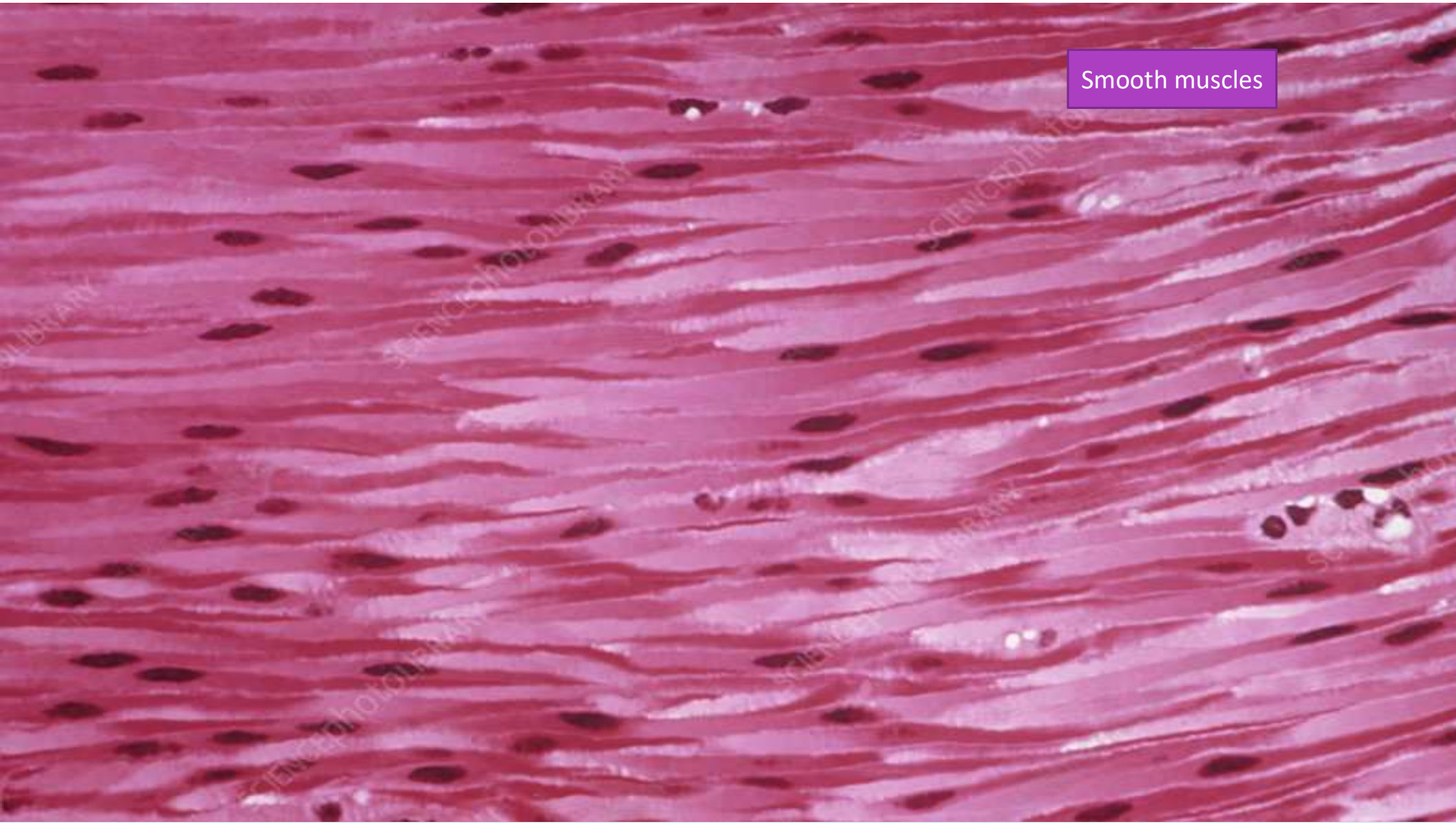
Glycogen

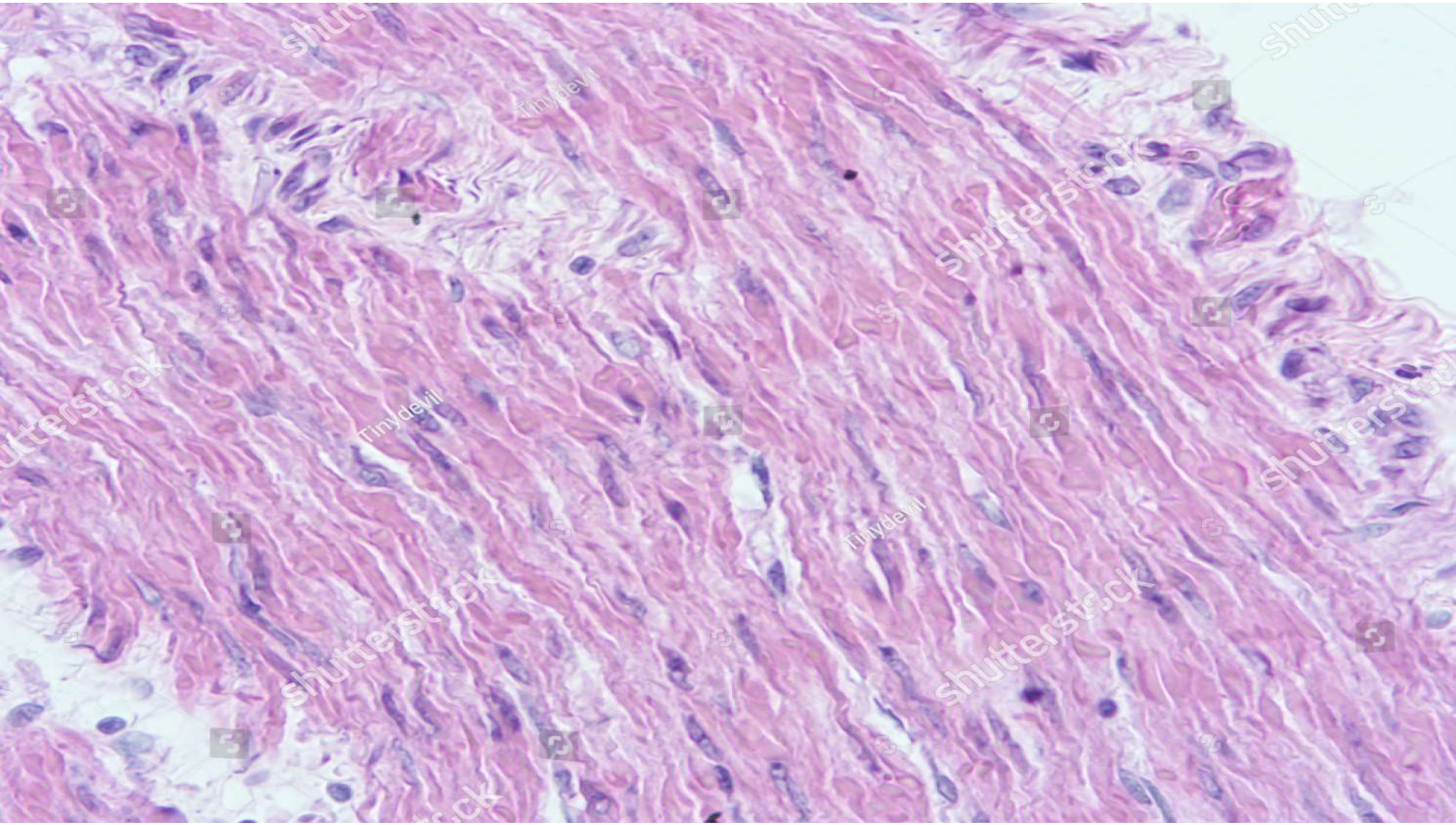


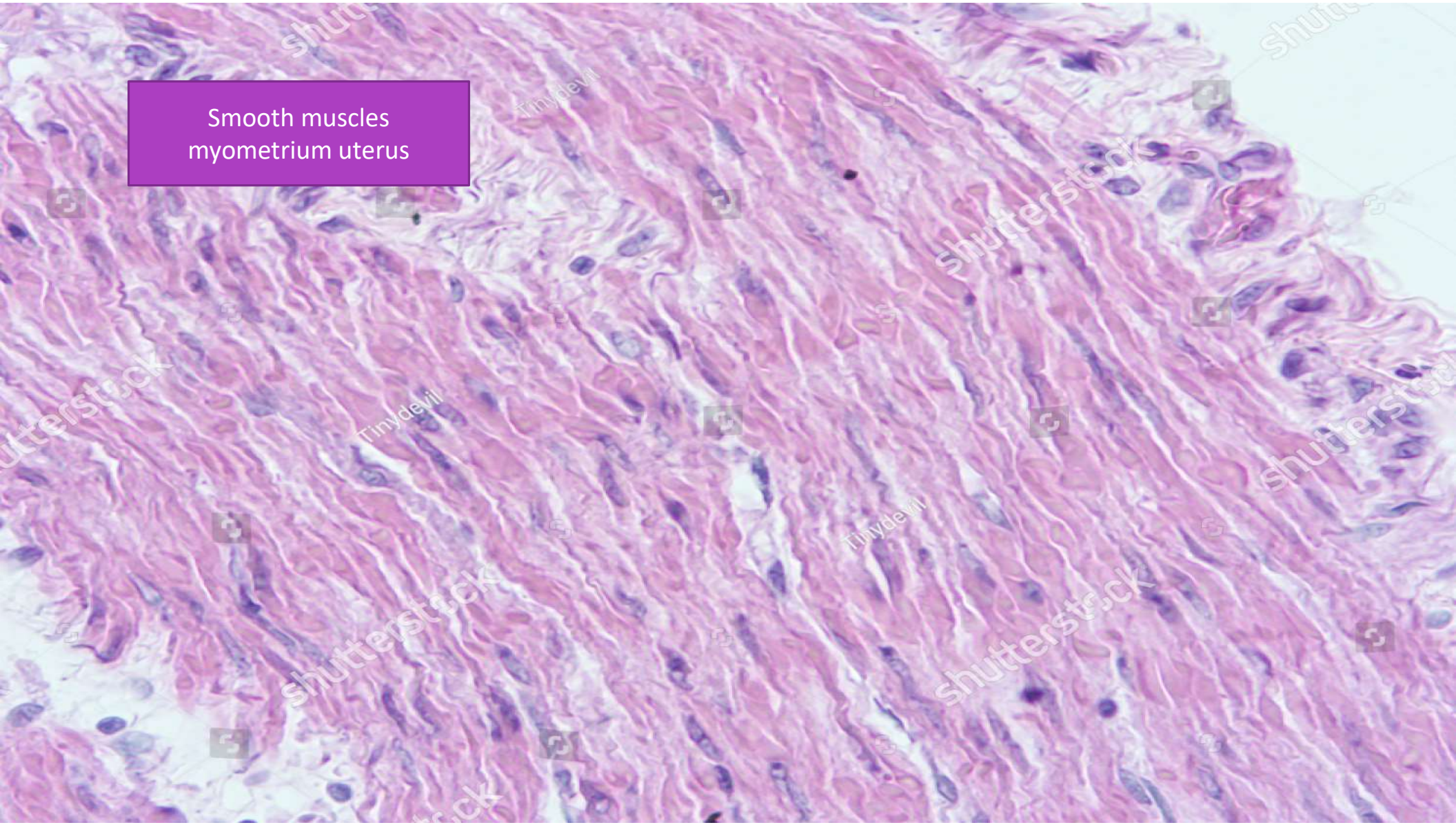


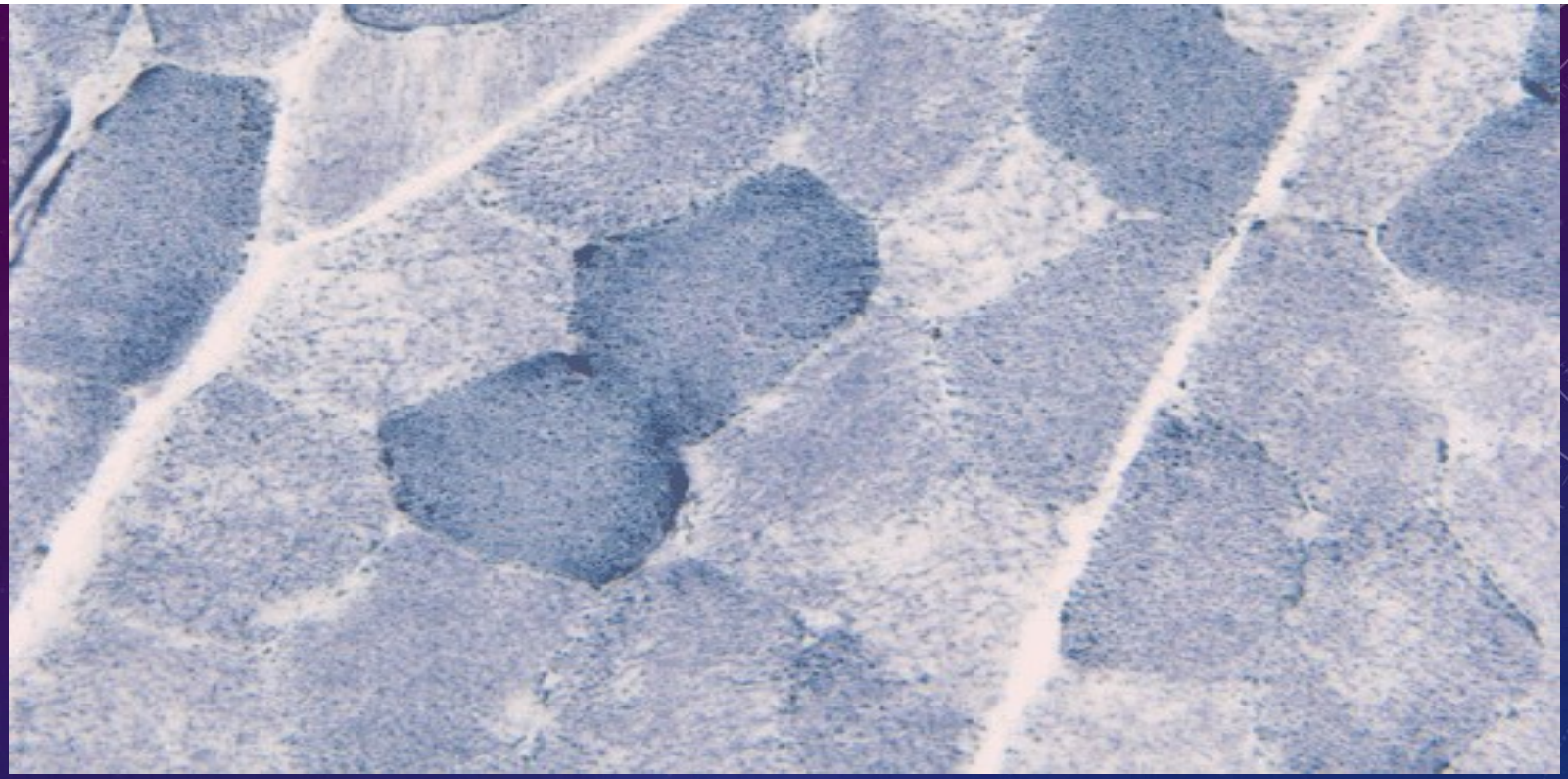

Smooth muscles




Smooth muscles




Smooth muscles
myometrium uterus



Identify these 2 type of skeletal muscles.

What is the functional difference between them?

RED MUSCLE FIBRE

- High content of myoglobin & cytochrome
- Many mitochondria
- Rich blood supply
- Slow & continuous contraction
- Smaller in diameter
- E.g: postural muscles

WHITE MUSCLE FIBRE

- Low content of myoglobin & cytochrome
- Few mitochondria
- Poor blood supply
- Rapid contractions
- Larger in diameter
- E.g: extra ocular muscles

What are the characteristics of smooth muscle?

What are the characteristics of smooth muscle?

Smooth muscle cell shape. The smooth muscle cell is fusiform in shape. The muscle cell tapers at both ends and round at the center. Smooth muscle has great elastic properties that can easily contract and relax, which is vital to organ systems, such as the stomach. It is also important in contraction and relaxation.

The filaments. We can **see the actin filaments** as the red lines of smooth muscle under a microscope, and it can pass from one region of the cell to another area by joining dense bodies of the cell membrane.

Single nucleus. The smooth muscle tissue is not striated and branched, and each cell has a single nucleus. The nucleus can be seen at the cell center and it controls all the activities within or out of the cell.

Elasticity. The smooth muscles return to normal length after stretching. They can come back to their original size as they have elasticity.

Contractility. Unlike the skeletal muscle tissues that can be contracted at will, the smooth muscle tissue is involuntarily controlled.

Lack of sarcomeres. Smooth muscles lack the sarcomeres, which are present in skeletal muscles. A sarcomere is a structural unit of myofibril that consists of dark and half of the adjacent white band. It is a characteristic feature of skeletal and cardiac muscles. Does smooth muscle have sarcomeres? The structure of smooth muscle, as compared to other muscles, lacks sarcomeres.

Lack of a tropomyosin complex. It **also lacks troponin C but has calmodulin to which calcium ions bind** to forming the Ca2+– calmodulin complex that activates the myosin kinase (phosphorylation enzyme).

Organ system involved in smooth muscles?

Organ system involved in smooth muscles

Smooth muscles are present in the following organs system of the body

- In the skin – erector pili of the skin
- In the urinary system (urinary bladder)
- In the reproductive system (both male and female reproductive tracts)
- In the GIT (stomach, intestine)
- In the sensory units – the eye (iris and ciliary muscle)
- In the CVS – blood vessel and lymphatic vessels

Types of Smooth muscle?

Types of Smooth muscle

Smooth muscles are of two types. They are:

1.Single-unit (visceral) smooth muscle: (GIT)All the cells function collectively and simultaneously as a single unit (unitary).
2.Location of single-unit smooth muscle: *smooth muscles are located in the internal lining of different hollow organs like the* ***reproductive system, the urinary bladder, liver, and the circulatory system's blood vessels****, where vascular smooth muscles are oriented in a circle around the vascular lumen and form numerous layers. In the eyes, they can change iris size and lens shape. It is also present in the skin, allowing the hair to stand straight in reaction to cooler conditions or worries.*

3.Multiunit smooth muscle: It is a type of muscle in which all the cells cannot function collectively and work independently.
Location of multiunit smooth muscle: such muscles are mostly located *in the lungs, the arrector pili muscles associated with hair follicles, in the large arteries, and also the internal eye muscles controlling the entry of light and lens formation.*

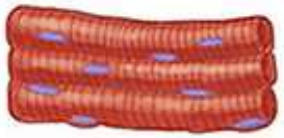
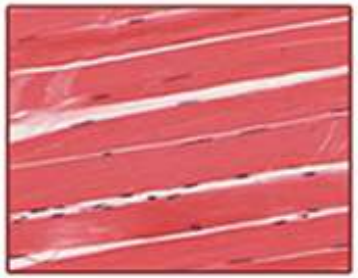
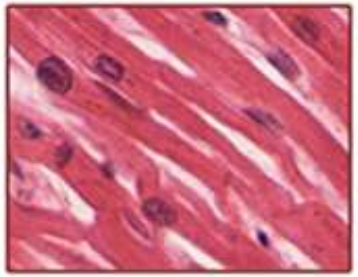
	Main features	Location	Type of cells	Histology
Skeletal muscle	- Fibers : striated, tubular and multi nucleated - Voluntary - Usually attached to skeleton			
Smooth muscle	- Fibers : non-striated, spindle-shaped, and uninucleated. - Involuntary - Usually covering wall of internal organs.			
Cardiac muscle	- Fibers : striated, branched and uninucleated. - Involuntary - Only covering walls of the heart.			

TABLE 9-1 Skeletal, Smooth, and Cardiac Muscle

	Skeletal	Smooth	Cardiac
Location	Skeletal muscles	Hollow viscera walls, blood vessels	Heart walls
Function	Movement of bones at joints, maintenance of posture	Viscera movement, peristalsis, vasoconstriction	Heart pumping
Striations	Present	None	Present
Nucleus	Many nuclei	Single nucleus	Single nucleus
Features	Good transverse tubule systems	No transverse tubules	Good transverse tubule systems, intercalated discs separating adjacent cells
Control	Voluntary	Involuntary	Involuntary
Contraction	Rapid contraction and relaxation	Slow contraction and relaxation, self-exciting, rhythmic	Cell network contracts as a unit, self-exciting, rhythmic

Muscles as Movers

Muscle Type	Muscle Function	Exercise	Muscle(s) Used
Agonist	Prime mover	Chest press	Pectoralis major
		Overhead press	Deltoid
		Row	Latissimus dorsi
		Squat	Gluteus maximus, quadriceps
Synergist	Assist prime mover	Chest press	Anterior deltoid, triceps
		Overhead press	Triceps
		Row	Posterior deltoid, biceps
		Squat	Hamstring complex
Stabilizer	Stabilize while prime mover and synergist work	Chest press	Rotator cuff
		Overhead press	Rotator cuff
		Row	Rotator cuff
		Squat	Transversus abdominis
Antagonist	Oppose prime mover	Chest press	Posterior deltoid
		Overhead press	Latissimus dorsi
		Row	Pectoralis major
		Squat	Psoas

MUSCLE NAME		ORIGIN	INSERTION	ACTION	NERVE SUPPLY/ NOTES
Muscles of the Head and Neck:					
Occipito-frontalis	**Frontalis**	Galea aponeurotica	Skin of eyebrows	raises eyebrows; wrinkles skin of forehead	Facial
	Occipitalis	Occipital & temporal	galea aponeurotica	fixes aponeurosis and pulls scalp posteriorly	Facial
Orbicularis oculi		Frontal & maxillary bones	Eyelids	Closes eye; blinking, squinting; draws eyebrows inferiorly	Facial
Orbicularis oris		Maxilla & mandible	Muscle and skin of mouth	Closes lips; purses and protrudes lips (as in kissing)	Facial
Buccinator		Maxilla and mandible	Orbicularis oris	Draws corner of mouth laterally; compresses cheek (whistling, sucking); holds food between teeth	Facial
Masseter		Zygomatic arch and maxilla	Body and ramus of mandible	Prime mover of mandible elevation	Trigeminal (Mandibular Branch)
Temporalis		Temporal fossa	Coronoid process of mandible	Elevates, retracts and moves mandible side-to-side	Trigeminal (Mandibular Branch)
Sternocleidomastoid		Sternum & clavicle	Mastoid process	Each turns head toward opposite side or tilts head laterally; together, flex head on chest	Accessory, Cervical Spinal Nerves (2-4)
Platysma		Fascia of chest	Lower margin of mandible and skin of mouth	Depresses mandible (agonist); pulls lip down and back; tenses skin of neck	Facial

Zygomaticus Major	Facial Expression, mouth	Facial N. (VII), Buccal Branch	Skin and superficial fascia at angle of mouth	Pull the angle of the mouth outward

EYES MUSCLES				
Inferior Oblique	Eye, oculomotor	Oculomotor N. (III), inferior division	Pulls the eyeball UP (NOT down!) on a MEDIALLY ROTATED eye. And, it ABDUCTS the eyeball.	
Inferior Rectus	Eye, oculomotor	Oculomotor N. (III), inferior division	Rotates the eyeball downward	
Lateral Rectus	Eye, oculomotor	Abducens N. (VI)	Abducts the eyeball	
Medial Rectus	Eye, oculomotor	Oculomotor N. (III), Inferior Division	Adducts the eyeball	
Superior Oblique	Eye, oculomotor	Trochlear N. (IV)	Pulls the eyeball DOWN (NOT up!) on a MEDIALLY ROTATED eye. And, it ABDUCTS the eyeball.	Its tendon goes through a TROCHLEA, on the superoMEDIAL margin of the frontal bone. Then the tendon attaches to the underside of the eyeball, thus explaining its action.
Superior Rectus	Eye, oculomotor	Oculomotor N. (III), Superior Division	Rotates the eyeball upward	

MUSCLE NAME		ORIGIN	INSERTION	ACTION	NERVE SUPPLY/ NOTES
Muscles of the Thorax, Shoulder, and Abdominal Wall:					
Rotator Cuff	**Supraspinatus (rotator cuff)**	Scapula (supraspinous fossa)	Greater tubercle of humerus	Stabilizes shoulder (helps prevent downward dislocation); assists in abduction	Suprascapular
	Infraspinatus (rotator cuff)	Scapula (infraspinous foss)	Greater tubercle	Holds head of humerus in glenoid cavity; stabilizes shoulder; rotates humerus laterally	Suprascapular
	Subscapularis (rotator cuff)	Subscapular fossa	Lesser tubercle	Medially rotates humerus; helps hold humerus in glenoid cavity	Subscapular nerve
	Teres minor (rotator cuff)	Lateral dorsal scapula	Greater tubercle	Holds head of humerus in glenoid cavity; stabilizes shoulder; rotates humerus laterally; adducts arm at shoulder	Axillary
Teres major		Posterior inferior scapula	Intertubercular groove	Extends, medially rotates, adducts humerus (synergist of latissimus dorsi)	Lower subscapular
Pectoralis major		Medial clavicle; sternum; costal cartilages 1-6	Intertubercular groove	Prime mover of arm flexion at shoulder; rotates arm medially; adducts arm against resistance; pulls ribs upward	Pectoral muscles
Pectoralis minor		Ribs 3-5 (or 2-4)	Coracoid process of scapula	Draws scapula forward and down (with ribs fixed); draws ribs up (with scapula fixed)	Pectoral nerves
Serratus anterior		Ribs 1-8 (or 9)	Vertebral border of scapula	Protracts and holds scapula against ribs; rotates scapula laterally and upward; raises point of shoulder; boxer's muscle	Long thoracic nerve

MUSCLE NAME	ORIGIN	INSERTION	ACTION	NERVE SUPPLY/ NOTES
Muscles of the Thorax, Shoulder and Abdominal Wall (continued):				
Deltoid	Clavicle; acromion & spine	Deltoid tuberosity	Abduction, flexion and extension of arm at shoulder; medial rotation (anterior); lateral rotation (posterior)	Axillary
Trapezius	Occipital bone; cervical vertebrae	Acromion and spine of scapula; clavicle	Stabilizes, retracts, raises, rotates scapula; extends with scapula fixed	Accessory and cervical spinal nerves
Latissimus dorsi	Spines of lower thoracic & lumbar vertebrae	Intertubercular groove	Arm adduction, medial rotation and extension at shoulder; depresses scapula; brings arm down in power stroke	Thoracodorsal nerve
Internal intercostal muscles	Superior border of rib below	Inferior border of rib above	Pull down on rib for forced expiration	Intercostal nerves
External intercostal muscles	Inferior border of rib above	Superior border of rib below	Pull up on rib for inspiration	Intercostal nerves
Diaphragm	Ribs, sternum, costal cartilages	Central tendon	Increase size of thoracic cavity for inspiration	Phrenic
External oblique	Lower 8 ribs	Linea alba (some to pubic crest and iliac crest)	Individually, flex vertebral column laterally or rotate trunk; together, aid flexion of vertebral column; increase intra-abdominal pressure	Intercostal nerves
Internal oblique	Lumbar fascia, iliac crest	Linea alba (to pubic crest and iliac crest)	Individually, flex vertebral column laterally or rotate trunk; together, aid flexion of vertebral column; increase intra-abdominal pressure	Intercostal nerves

MUSCLE NAME	ORIGIN	INSERTION	ACTION	NERVE SUPPLY/ NOTES
Muscles of the Thorax, Shoulder and Abdominal Wall (continued):				
Transversus abdominis	Inguinal ligament; last 6 costal	Linea alba; pubic crest	increase intra-abdominal pressure	Intercostal nerves
Rectus abdominis	Pubic crest and symphysis	Sternum & 5-7 costal cartilages	Flex and rotate lumbar vertebral column; stabilize pelvis during walking; increase intra-abdominal pressure	Intercostal nerves
Rhomboids	Spinous processes of C7 -T5	Medial border of scapula	Retracts scapula; rotates scapula downward (when arm is lowered against resistance; paddling muscle); stabilizes	Dorsal scapular nerve

Sternocleidomastoid	Sternum & clavicle	Mastoid process	Each turns head toward opposite side or tilts head laterally; together, flex head on chest	Accessory, Cervical Spinal Nerves (2-4)
Platysma	Fascia of chest	Lower margin of mandible and skin of mouth	Depresses mandible (agonist); pulls lip down and back; tenses skin of neck	Facial
Trapezius	Occipital bone; cervical vertebrae	Acromion and spine of scapula; clavicle	Stabilizes, retracts, raises, rotates scapula; extends with scapula fixed	Accessory and cervical spinal nerves

Sternocleidomastoid	Neck	Spinal Accessory (XI), Spinal Root	Mastoid Process of Temporalis Bone	Sternum and Clavicle		It's a BRANCHIAL muscle, innervated by SVE fibers; Divides anterior and posterior triangles of neck
Trapezius	Neck	Spinal Accessory (XI), Spinal Root	Superior Nuchal Line and Spinous Processes of Vertebrae C7-T12	Clavicle, Acromion, Scapula	Raise the shoulders	It's a BRANCHIAL muscle, innervated by SVE fibers

Splenius Capitus	Suboccipital, Superficial	Cervical Spinal Nerves	Ligamentum Nuchae, Spinous Processes C7-T3	Occipital Bone near Mastoid Process

Muscles of the Pelvis and Lower Appendage That Act on the Thigh and Upper Leg

Iliopsoas	**Iliacus**	iliac fossa and crest; sacrum	femur below lesser trochanter	prime mover of thigh flexion at hip	Femoral
	Psoas major	lumbar vertebrae	lesser trochanter	prime mover of thigh flexion at hip; lateral flexion of vertebral column; posture	Femoral
Gluteus maximus		Dorsal ilium; sacrum; coccyx	Gluteal tuberosity; iliotibial tract	Major thigh extensor, especially when thigh is flexed (as in climbing); laterally rotates & abducts thigh	Inferior gluteal
Gluteus medius		Lateral ilium	Greater trochanter	Thigh abduction; medial thigh rotation; stabilizes hip when walking	Superior gluteal

Muscles of the Upper Appendage (Arm) that act on the Forearm:				
Biceps brachii	Coracoid process; tubercle over glenoid cavity	Radial tuberosity	Flexes and supinates arm at elbow; weak flexor at shoulder	Musculocutaneous
Brachialis	Front of distal humerus	Coronoid process	Flexes arm at elbow	Musculocutaneous
Brachioradialis	Supracondylar ridge humerus	Styloid process of radius	Synergist of arm flexion at elbow; stabilizes elbow (rapid movements)	Radial nerve
Triceps brachii	Scapula; humerus	Olecranon process	Extends arm at elbow; assists arm adduction	Radial

MUSCLE NAME	ORIGIN	INSERTION	ACTION	NERVE SUPPLY/ NOTES
Muscles of the Upper Appendage (Arm) that act on the Forearm (continued):				
Supinator	Lateral epicondyle	Proximal radius	Supinates forearm	Radial (Posterior interosseous)
Pronator teres	Medial epicondyle; coronoid process	Lateral radius (midshaft)	Pronates forearm; weak elbow flexor	Median
Anconeus	Lateral epicondyle	Olecranon process	Abducts ulna during pronation; aids elbow extension	Radial
Coracobrachialis	Coracoid process	Medial humerus	Flexion and abduction of humerus	Musculocutaneous
Muscles of the Upper Appendage (Forearm) that act on the Wrist, Hand, and Fingers:				
Flexor carpi ulnaris	Medial epicondyle; olecranon process	Carpals; 5th metacarpals	Flexes wrist; adducts hand (with extensor carpi ulnaris); stabilizes wrist for finger extension	**Ulnar**
Palmaris longus	Medial epicondyle	Palmar aponeurosis	Weak wrist flexor; weak synergist of elbow flexion; not present in all people	Median
Flexor carpi radialis	Medial epicondyle	Base of 2nd & 3rd metacarpals	Flexes wrist; abducts wrist; weak synergist of elbow flexion	Median

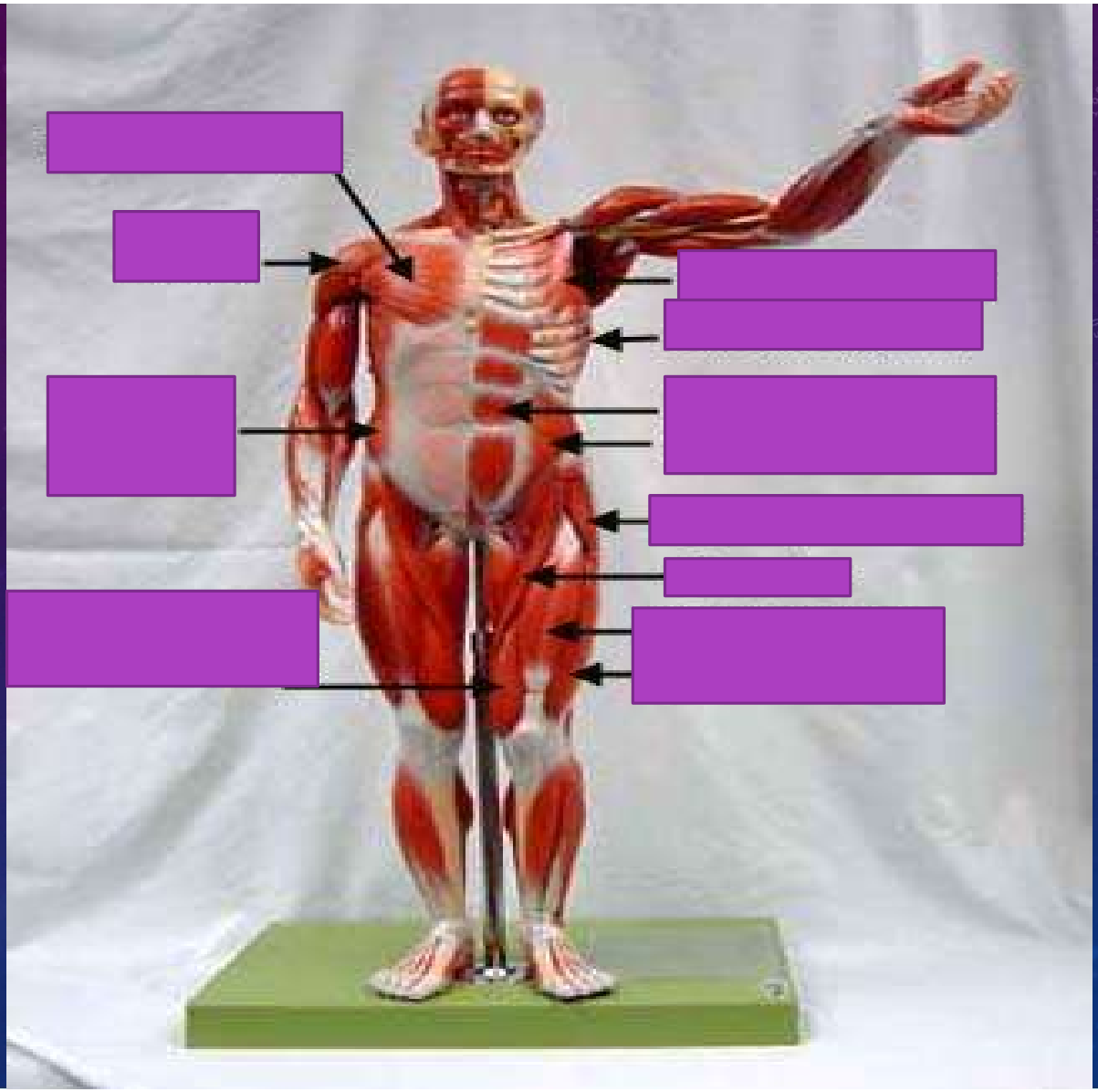
Muscles of the Upper Appendage (Forearm) that act on the Wrist, Hand, and Fingers (continued):

Flexor digitorum superficialis	Medial epicondyle; coronoid	Middle phalanges 2-5	Flexes wrist and middle phalanges of digits 2-5 (fast acting)	Median
Extensor carpi ulnaris	Lateral epicondyle	Base of 5th metacarpal	Extends wrist; adducts wrist	Radial (Posterior interosseous)
Extensor digitorum	Lateral epicondyle	Distal phalanges 2-5	Extends digits, weak wrist extensor; abducts (flares) fingers	Radial (posterior interosseous)
Flexor pollicis longus	Radius; interosseous membrane	Distal thumb phalanx	Flexes distal phalanx of thumb	Median
Flexor digitorum profundus	Coronoid process anterior ulna	Distal phalanges of 2-5	Flexes digits (slow); weak synergist of wrist flexion	Ulnar (medial half); median (lateral half)
Pronator quadratus	Distal ulna	Distal anterior radius	Prime mover of forearm pronation	Median
Extensor carpi radialis longus	Lateral supracondylar ridge	Base of 2nd metacarpal	Extends wrist; abducts wrist (with flexor radialis)	Radial
Extensor carpi radialis brevis	Lateral epicondyle	Base of 3rd metacarpal	Extends wrist; abducts wrist; steadies wrist during finger extension	Radial

Muscles of the Lower Appendage (Thigh) that act on the Knee:

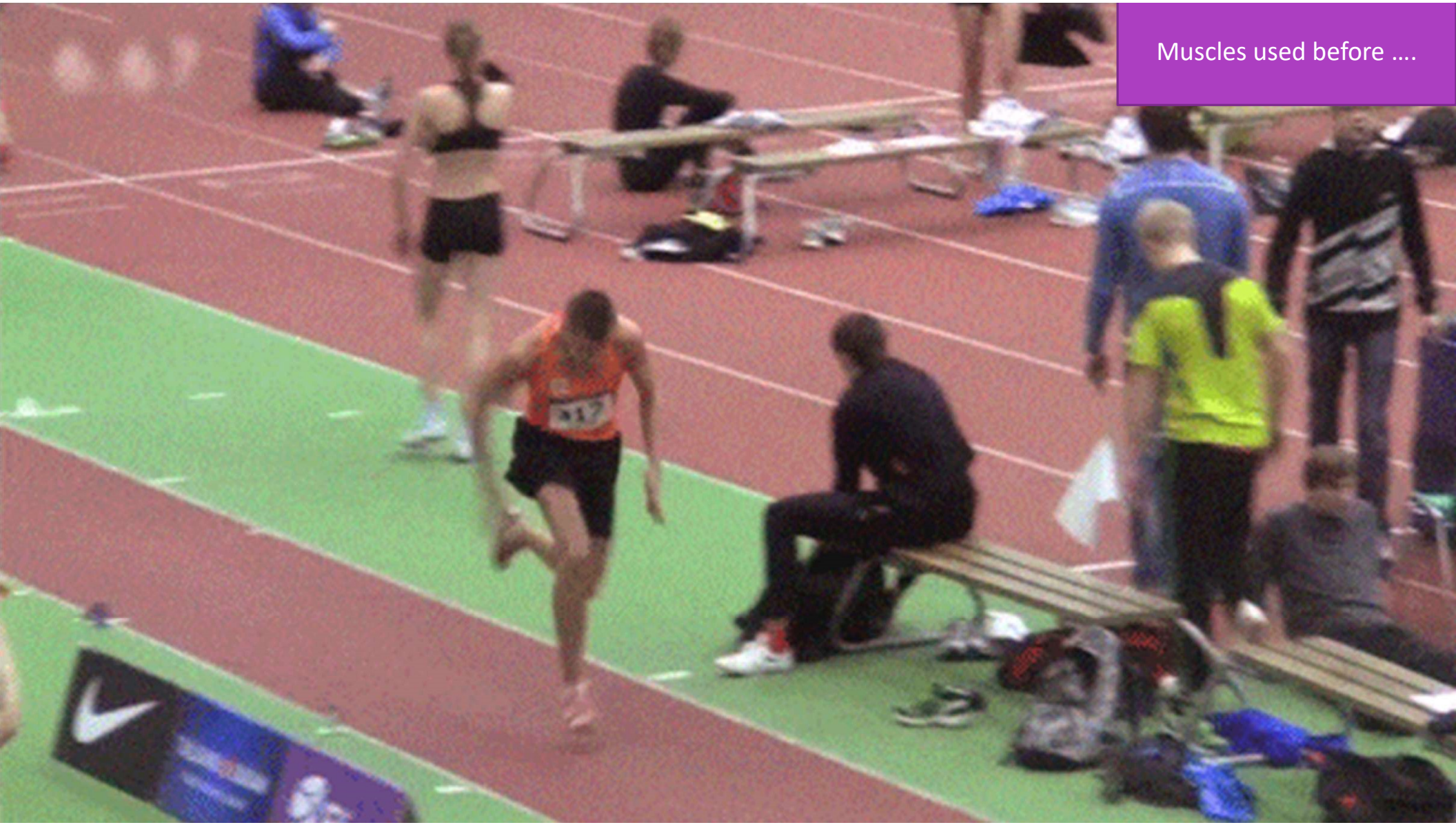
Hamstrings	**Biceps femoris**	Ischial tuberosity / linea alba	Lateral condyle of tibia; fibula	Extends thigh, flexes knee; laterally rotates leg	(branch) Tibial
	Semimembranosus	Ischial tuberosity	Medial proximal tibia	Extends thigh, flexes knee; medially rotates leg	(branch) Tibial
	Semitendinosus	Ischial tuberosity	Medial proximal tibia	Extends thigh, flexes knee; medially rotates leg	(branch) Tibial
Quadriceps femoris	**Rectus femoris**	Anterior inferior iliac spine	Tibial tuberosity via patellar ligament	Extends knee; flexes thigh on hip	Femoral
	Vastus lateralis	Greater trochanter; linea aspera	Tibial tuberosity via patellar ligament	Extends knee; stabilizes knee	Femoral
	Vastus intermedius	linea aspera	Tibial tuberosity via patellar ligament	Extends knee; stabilizes knee	Femoral
	Vastus medialis	Anterolateral proximal femur	Tibial tuberosity via patellar ligament	Extends knee; stabilizes knee	Femoral

Muscles of the Lower Appendage (Thigh) that act on the Knee (continued):					
Sartorius		Anterior superior iliac spine	Medial proximal tibia	Flexes abducts, laterally rotates knee; tailor's muscle	Femoral
Adductors	**Adductor magnus**	Ischial tuberosity; pubis	Linea aspera; adductor tubercle	**Anterior**: adducts, medially rotates thigh; flexes thigh **Posterior**: extends thigh	Obturator
	Adductor longus	Pubis	Linea aspera	Adducts, flexes thigh, medially rotates thigh	Obturator
	Gracilis	Pubis, ischium	Medial tibia	Adducts, flexes and medially rotates thigh; flexes knee	Obturator
Muscles of the Lower Appendage (Leg) that act on the Knee:					
Triceps surae	**Gastrocnemius**	Medial & lateral femoral condyles	Calcaneus	Plantar flexes foot when knee is extended; flexes knee when foot is dorsiflexed	(branch) Tibial
	Soleus	Tibia, fibula	Calcaneus	Plantar flexes	(branch) Tibial
Tibialis anterior		Tibia, interosseous membrane	Medial cuneiform; 1st metatarsal	Dorsiflexes and inverts foot	(branch) Common Fibular

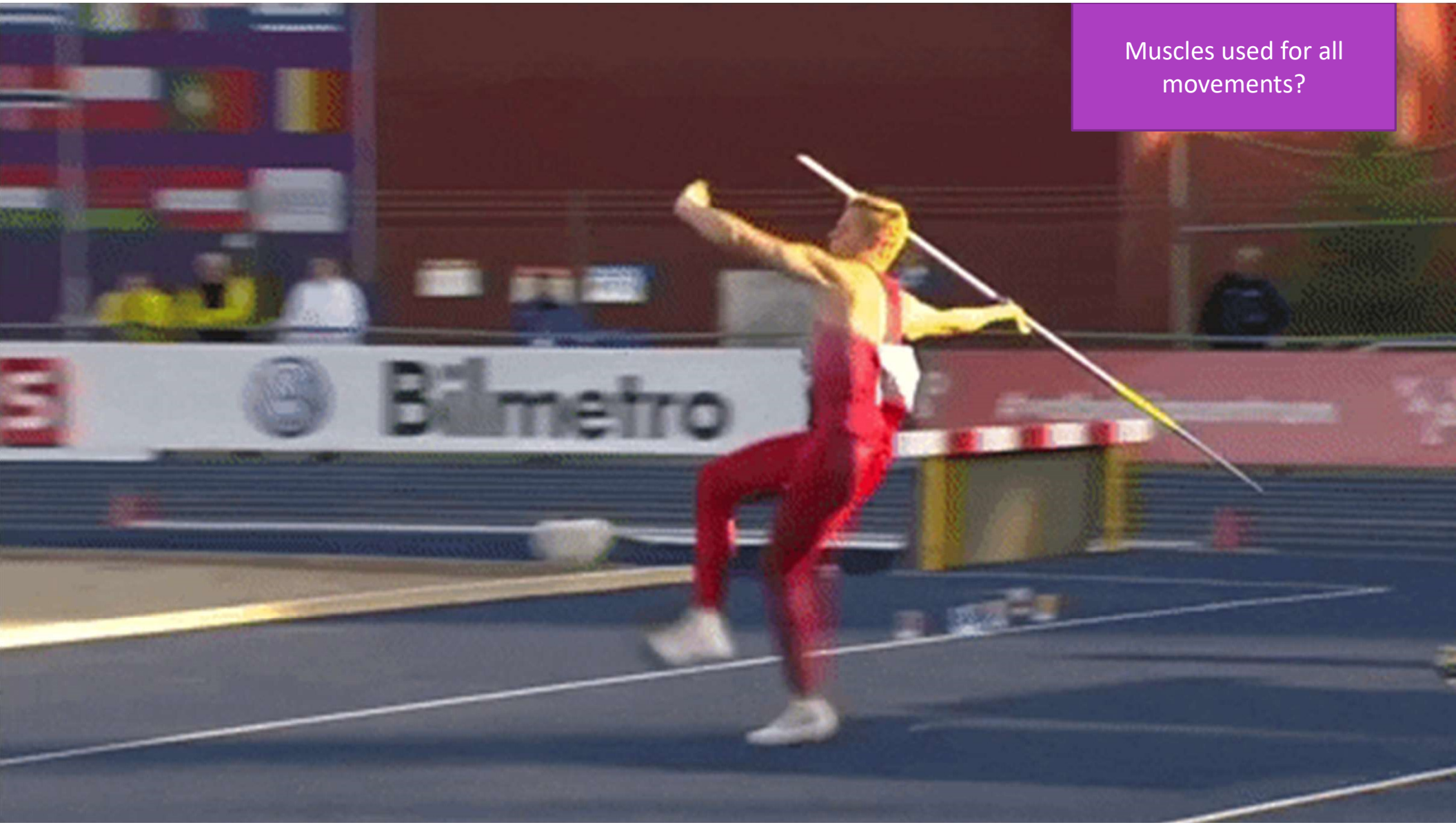



Pectoralis major
Deltoid
Pectoralis minor
Serratus anterior
Rectus abdominis
External oblique
Internal oblique
Tensor fasciae latae
Sartorius
Rectus femoris
Vastus medialis
Vastus lateralis

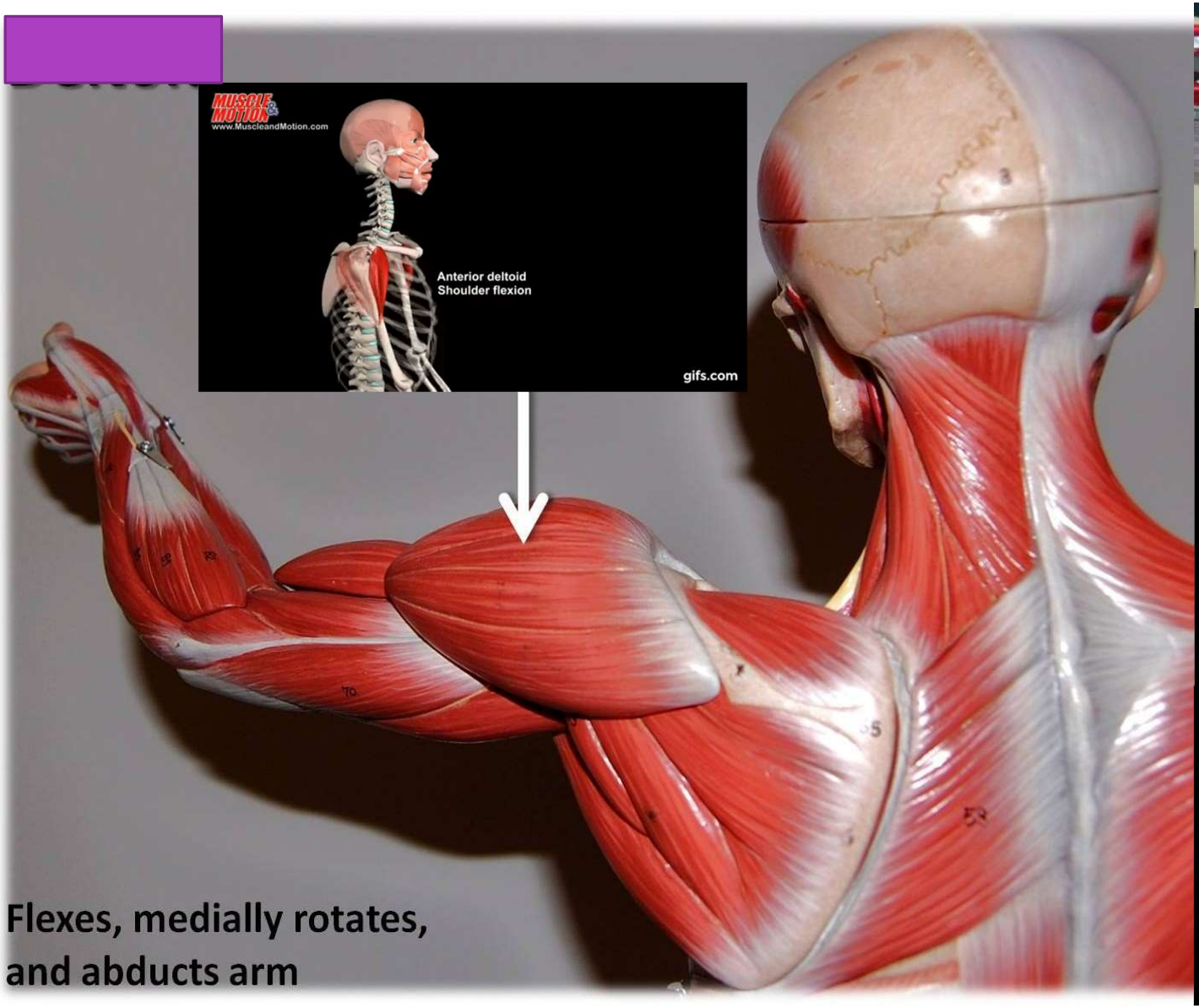

Muscle review
D .Hammoudi.MD
The models plastic and athletes



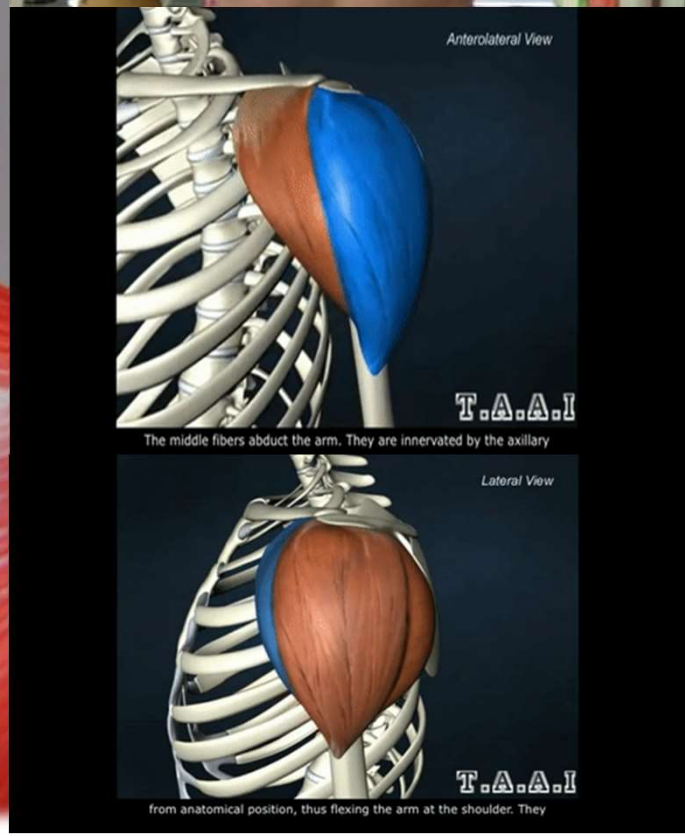
Muscles used before ….



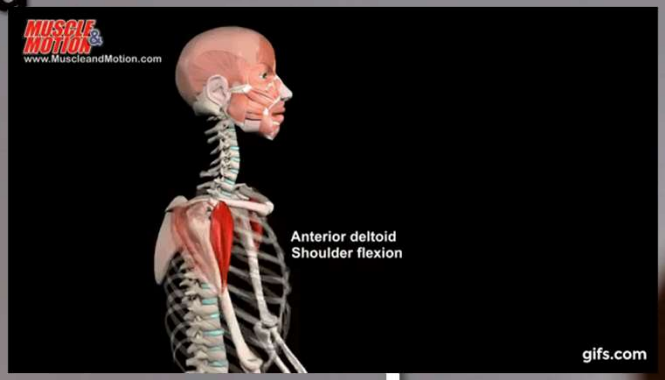
Muscles used for all movements?



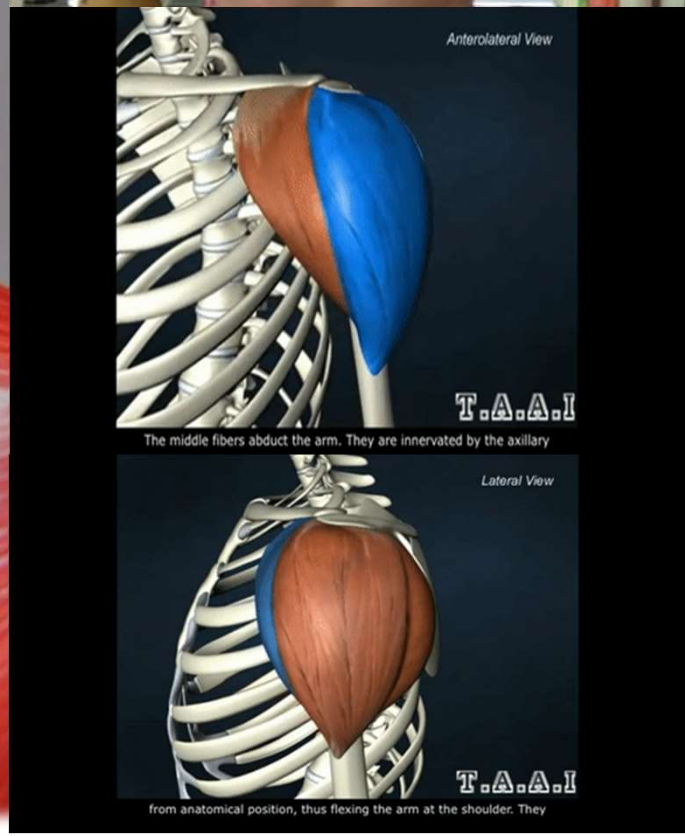
Flexes, medially rotates, and abducts arm

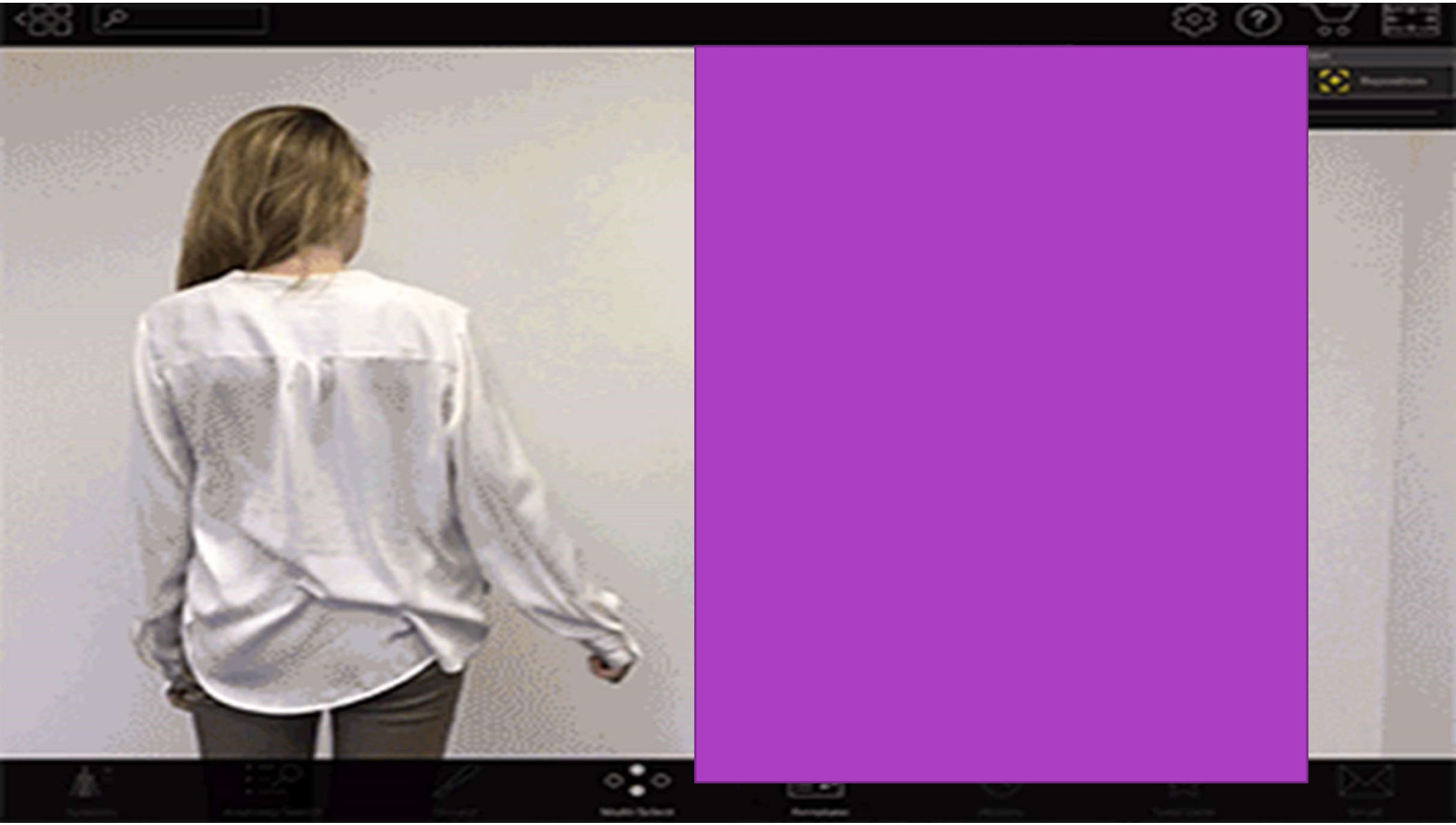


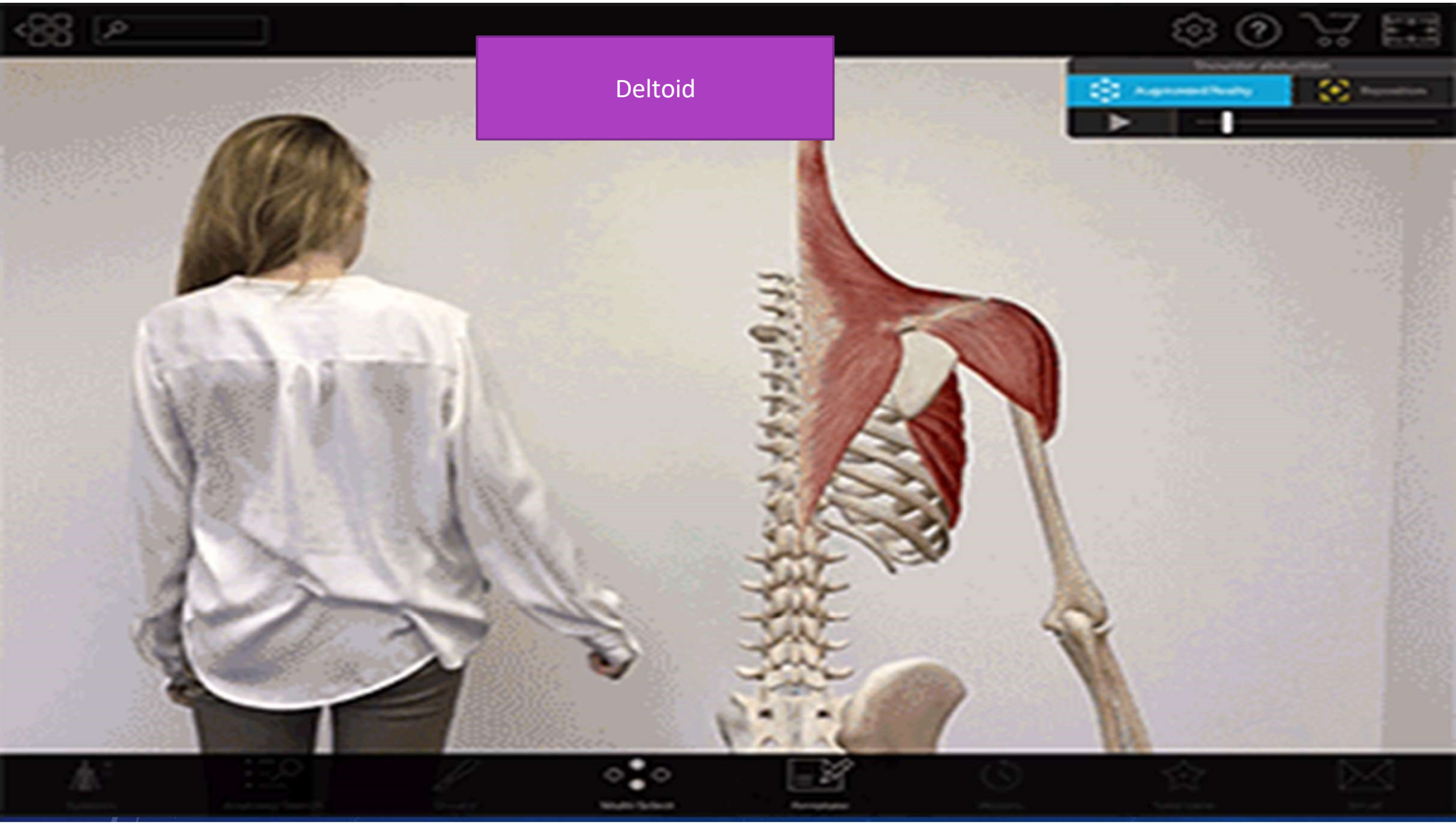
Deltoid

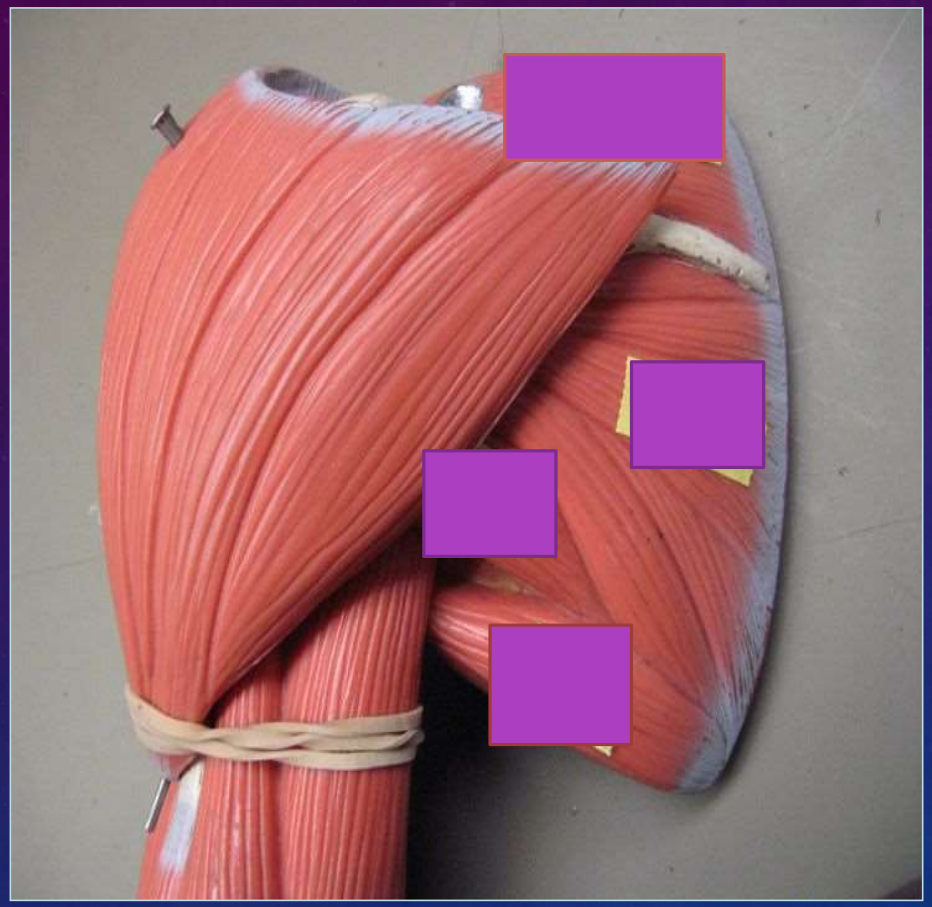


Flexes, medially rotates, and abducts arm

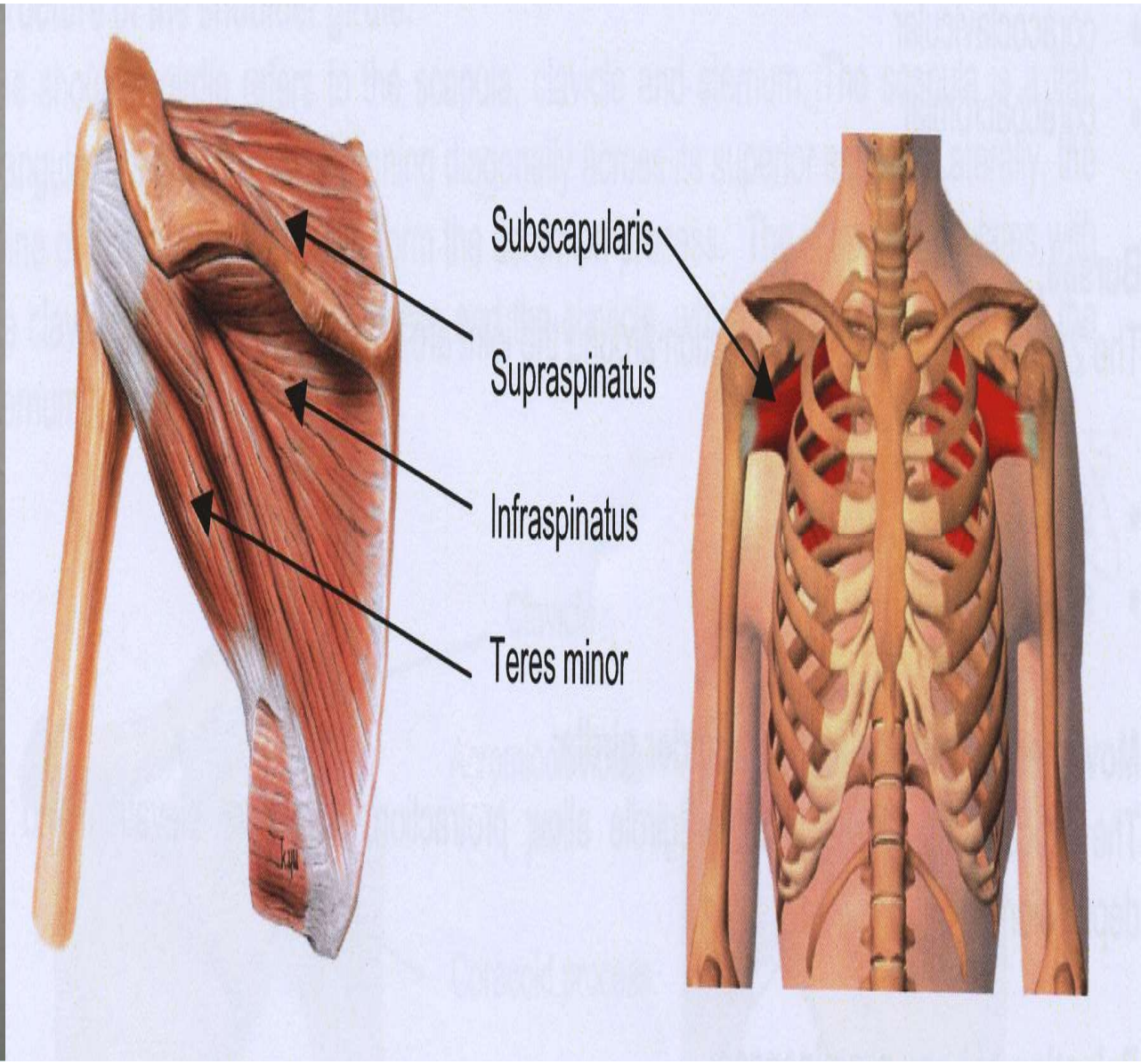


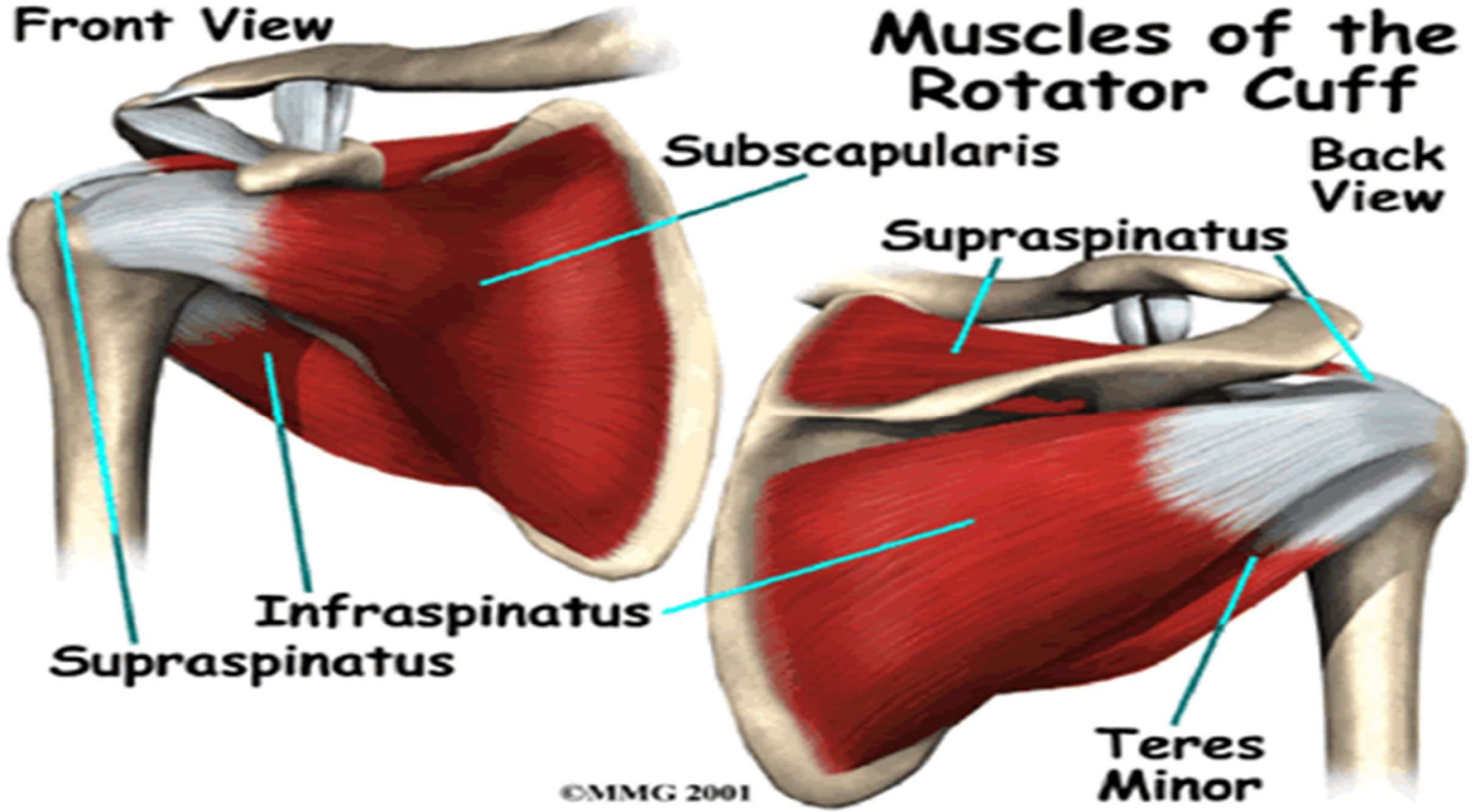


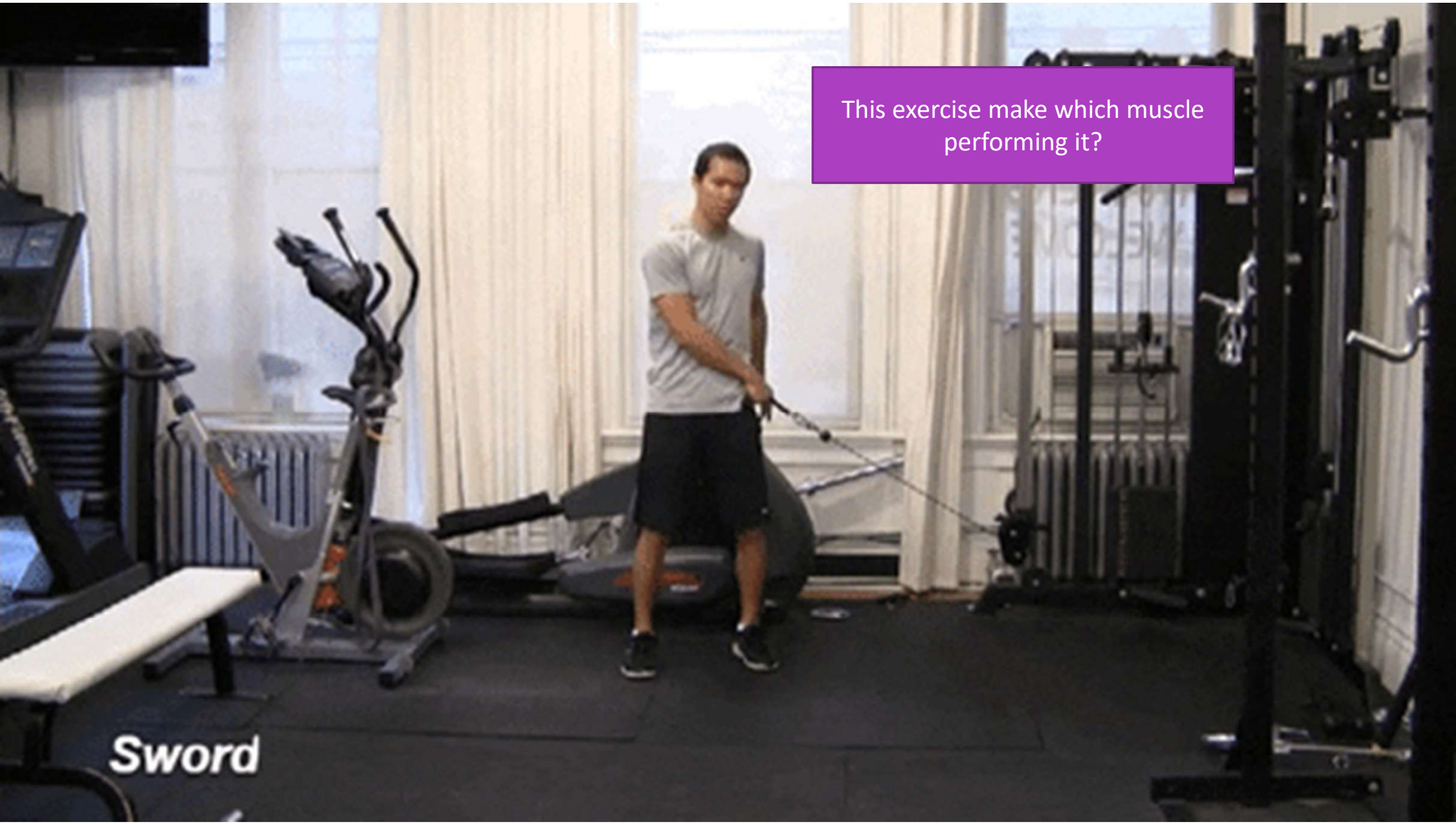

Deltoid



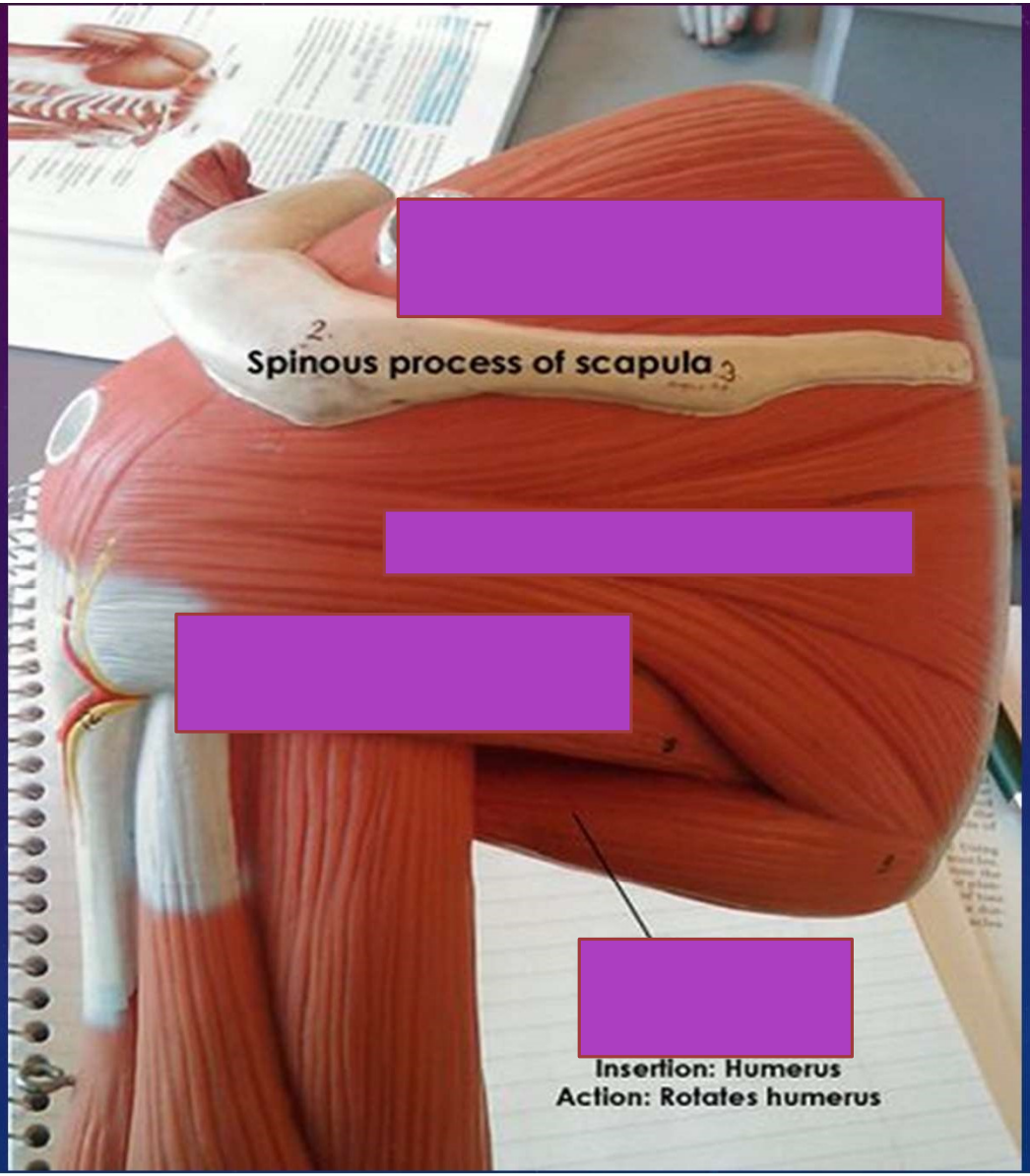

Supraspinatus
Infraspinatus
Teres Minor
Teres Major

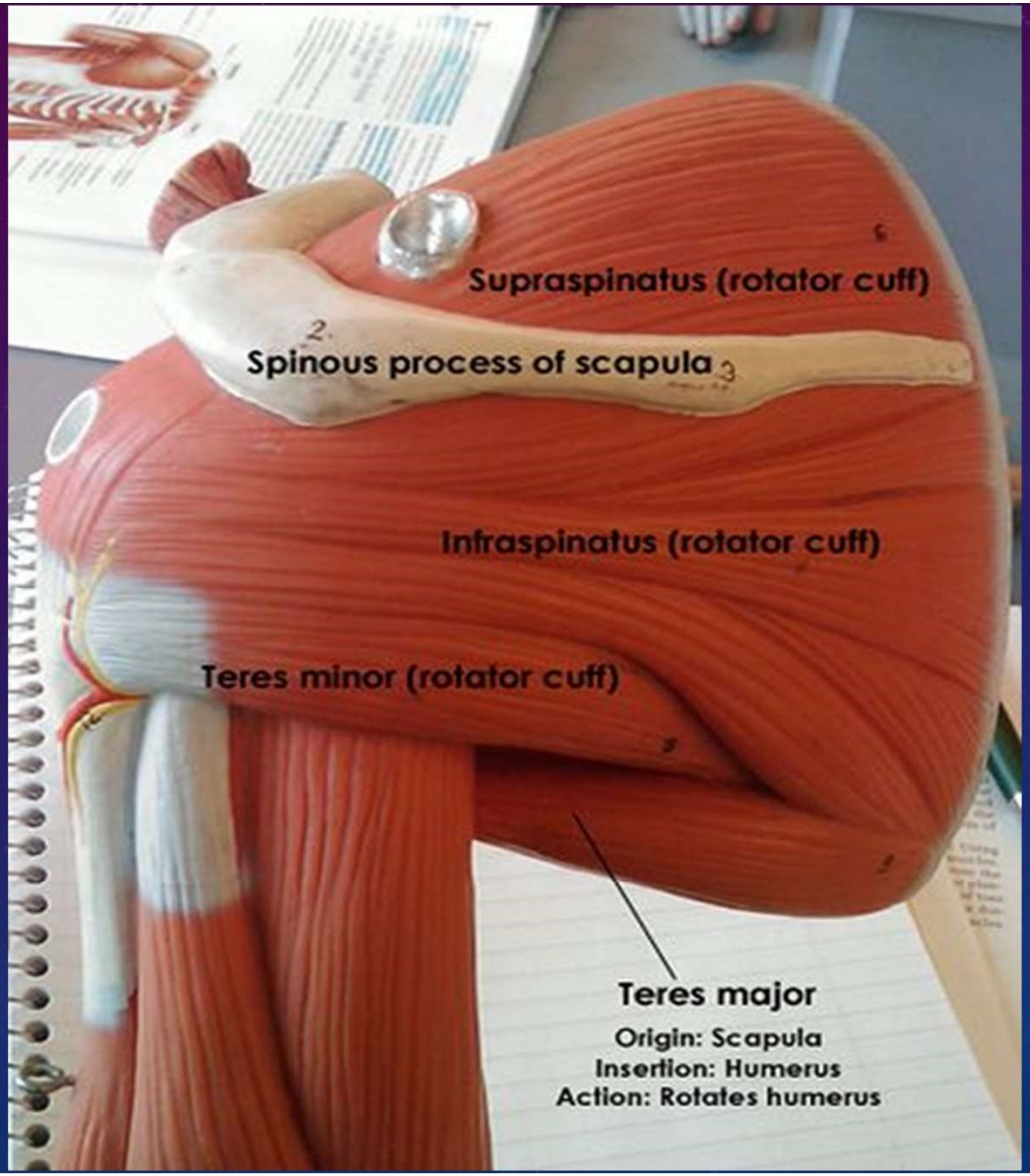

Subscapularis
Supraspinatus
Infraspinatus
Teres minor


Front View
Muscles of the Rotator Cuff
Subscapularis
Back View
Supraspinatus
Infraspinatus
Supraspinatus
Teres Minor
©MMG 2001

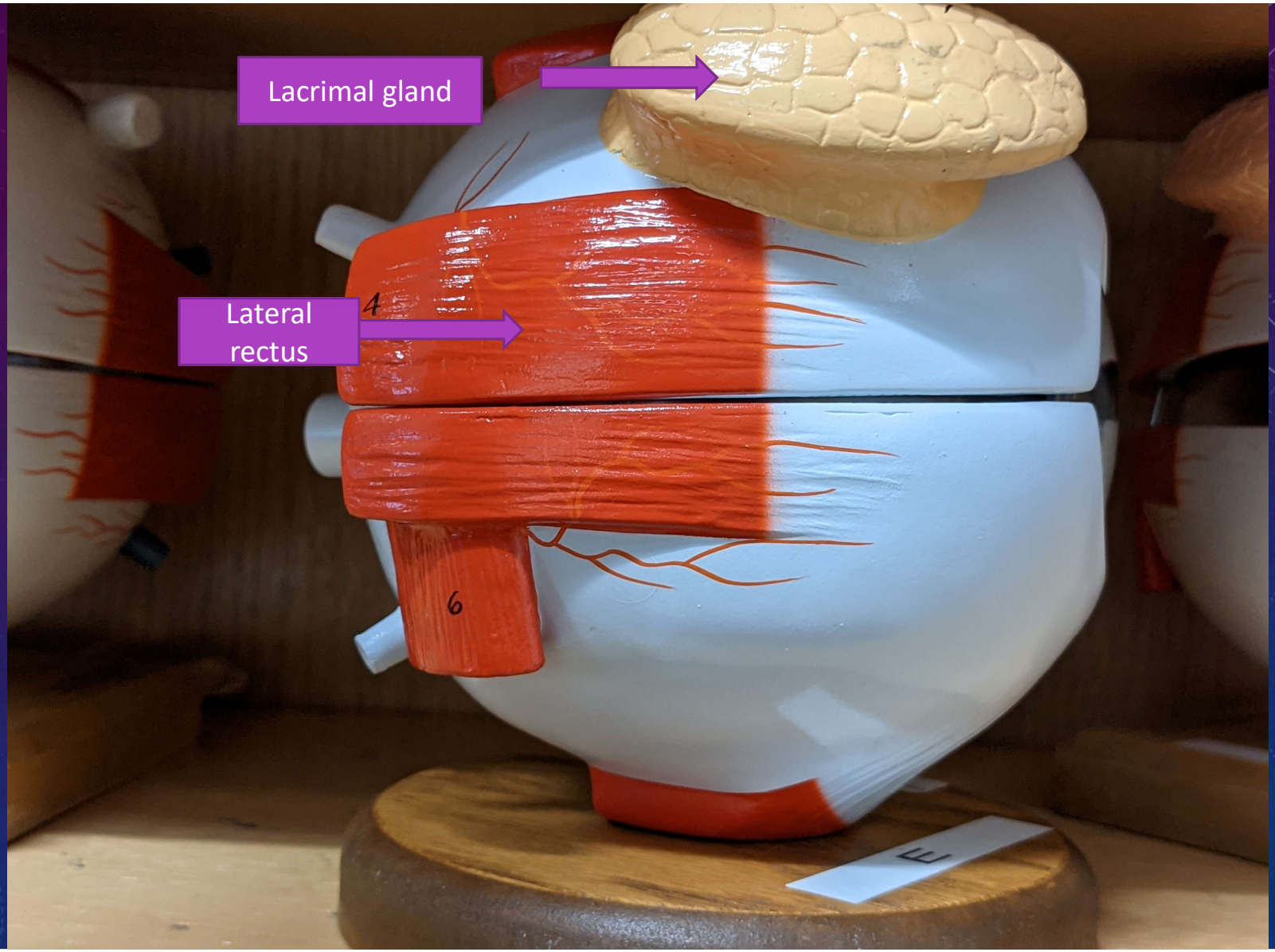

This exercise make which muscle performing it?
Sword

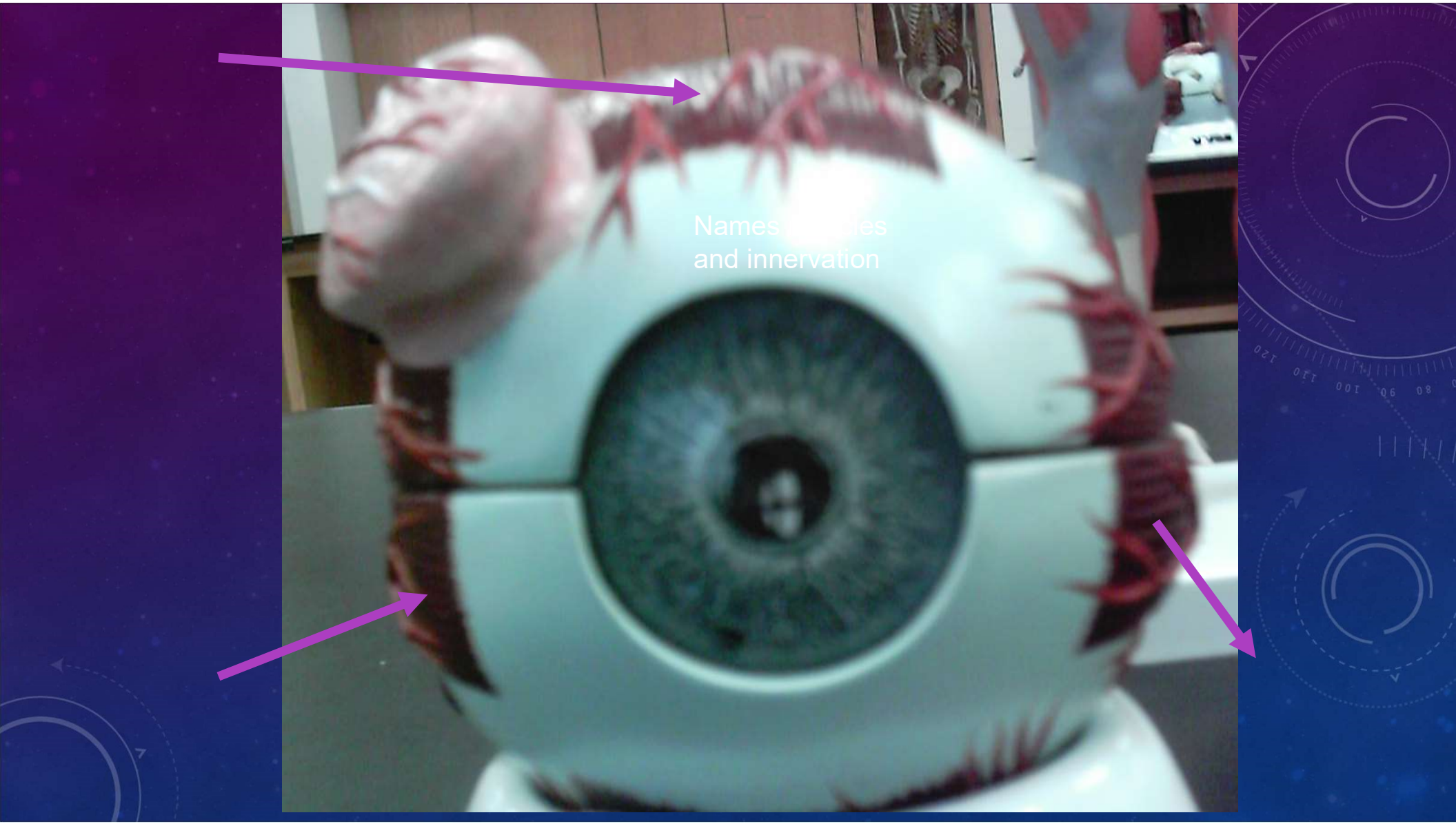
Supraspinatus muscle


Spinous process of scapula
Insertion: Humerus
Action: Rotates humerus


Supraspinatus (rotator cuff)
Spinous process of scapula
Infraspinatus (rotator cuff)
Teres minor (rotator cuff)
Teres major
Origin: Scapula
Insertion: Humerus
Action: Rotates humerus

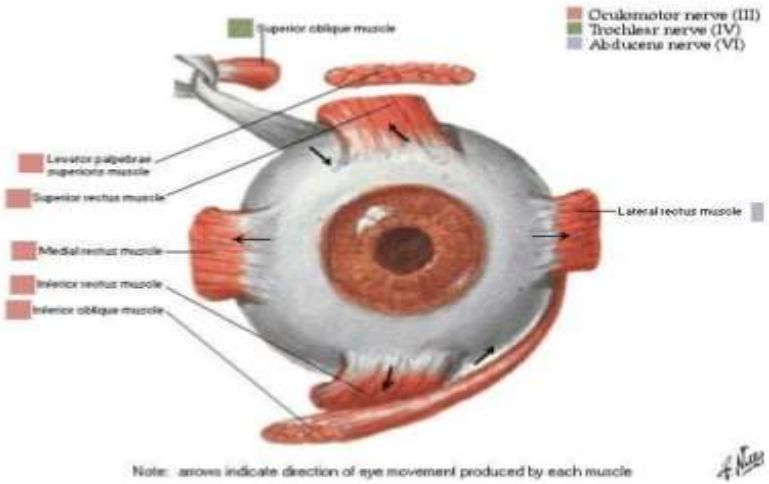

4
6
E


Lacrimal gland
Lateral rectus
4
6
E


and innervation

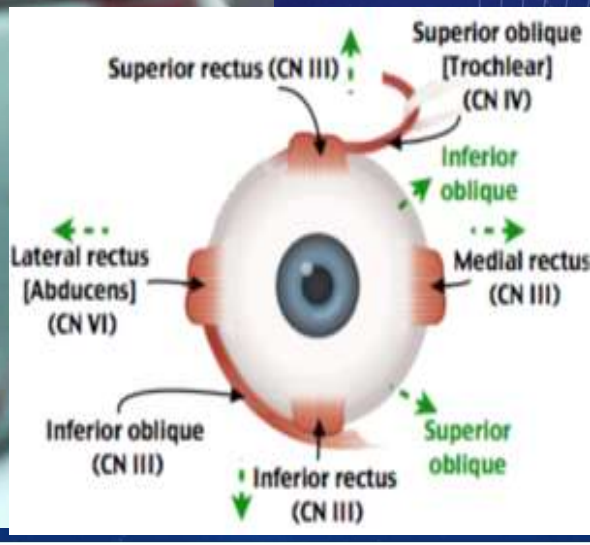
EYE MUSCLES

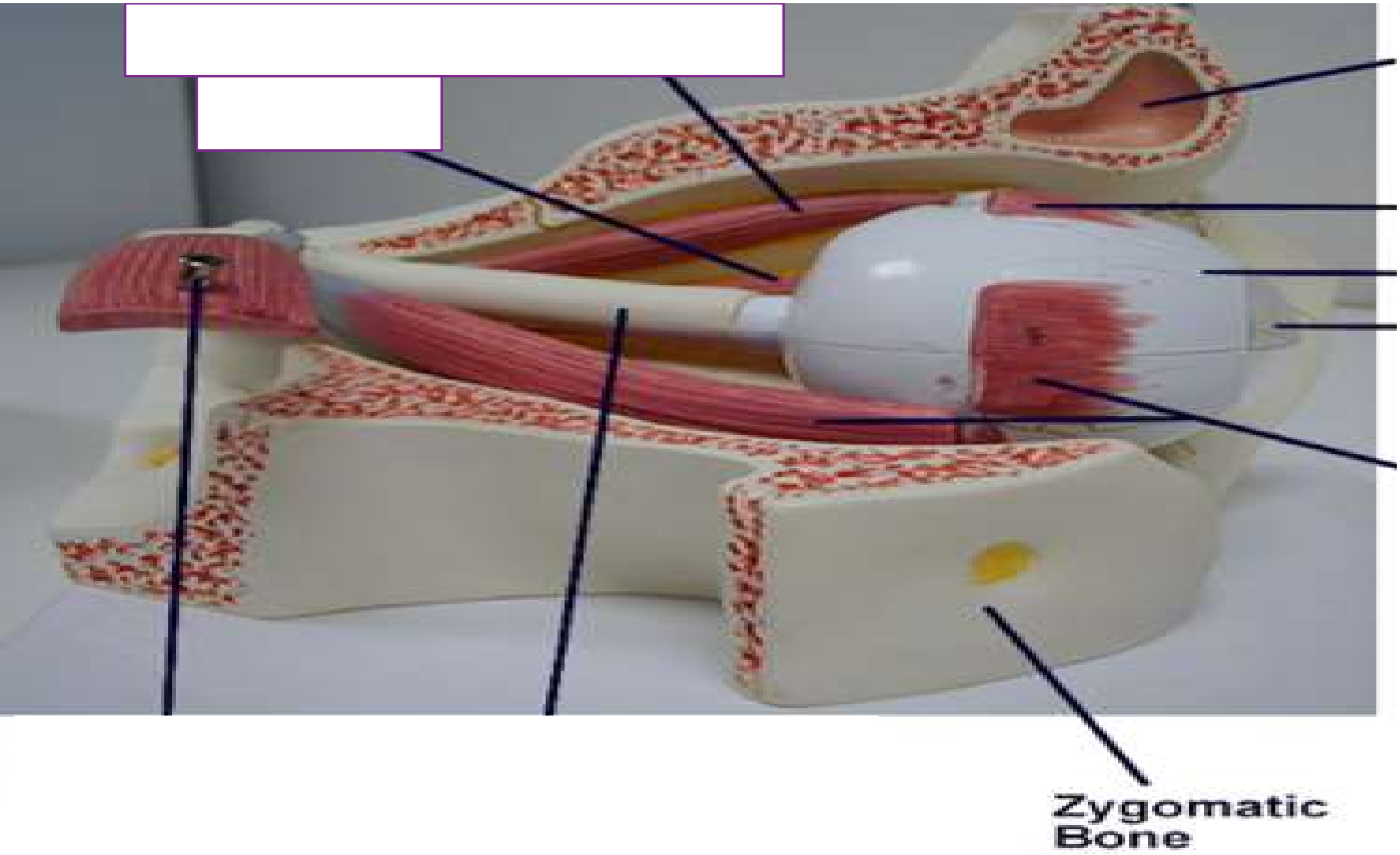
Names muscles and innervation

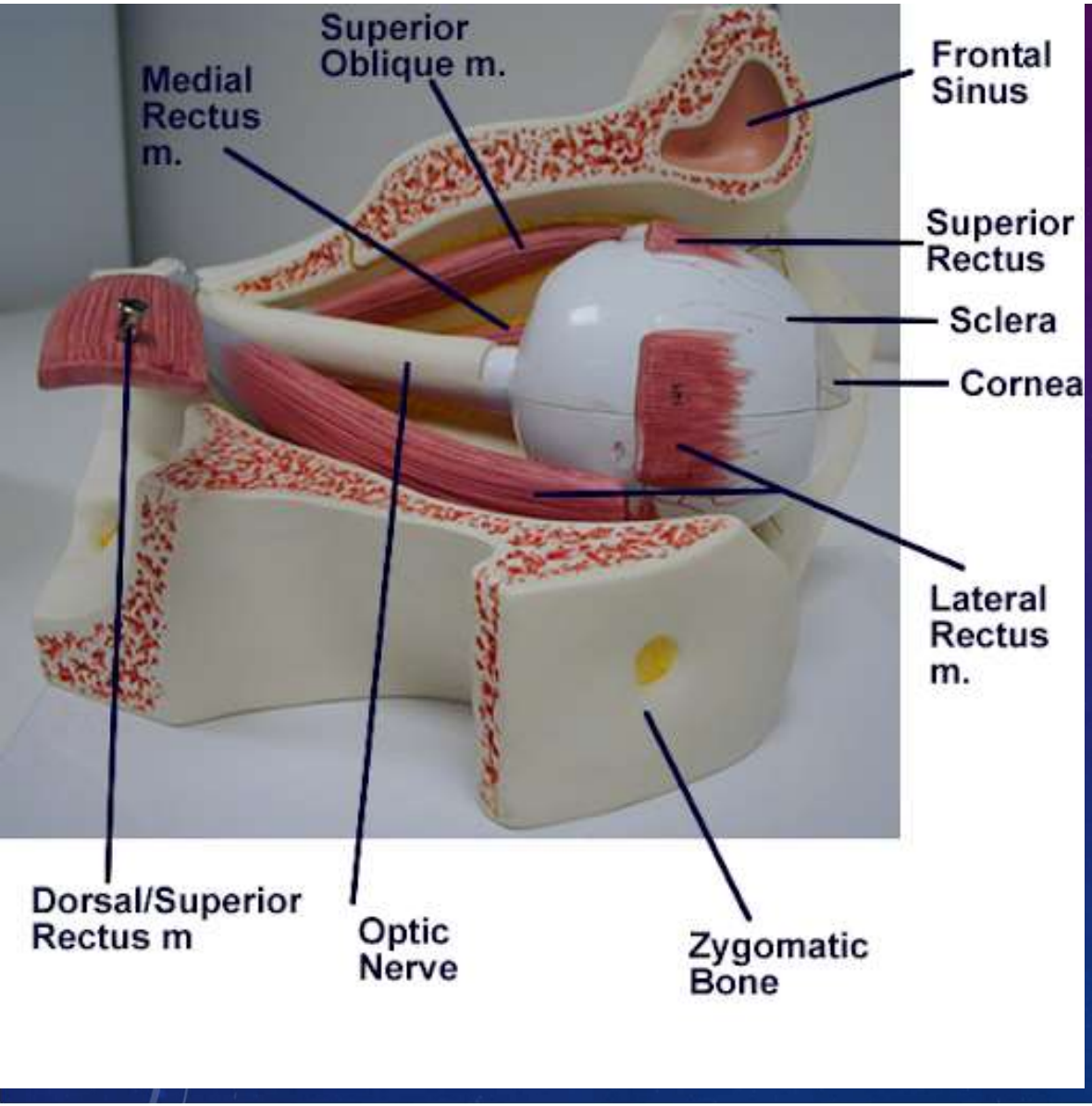


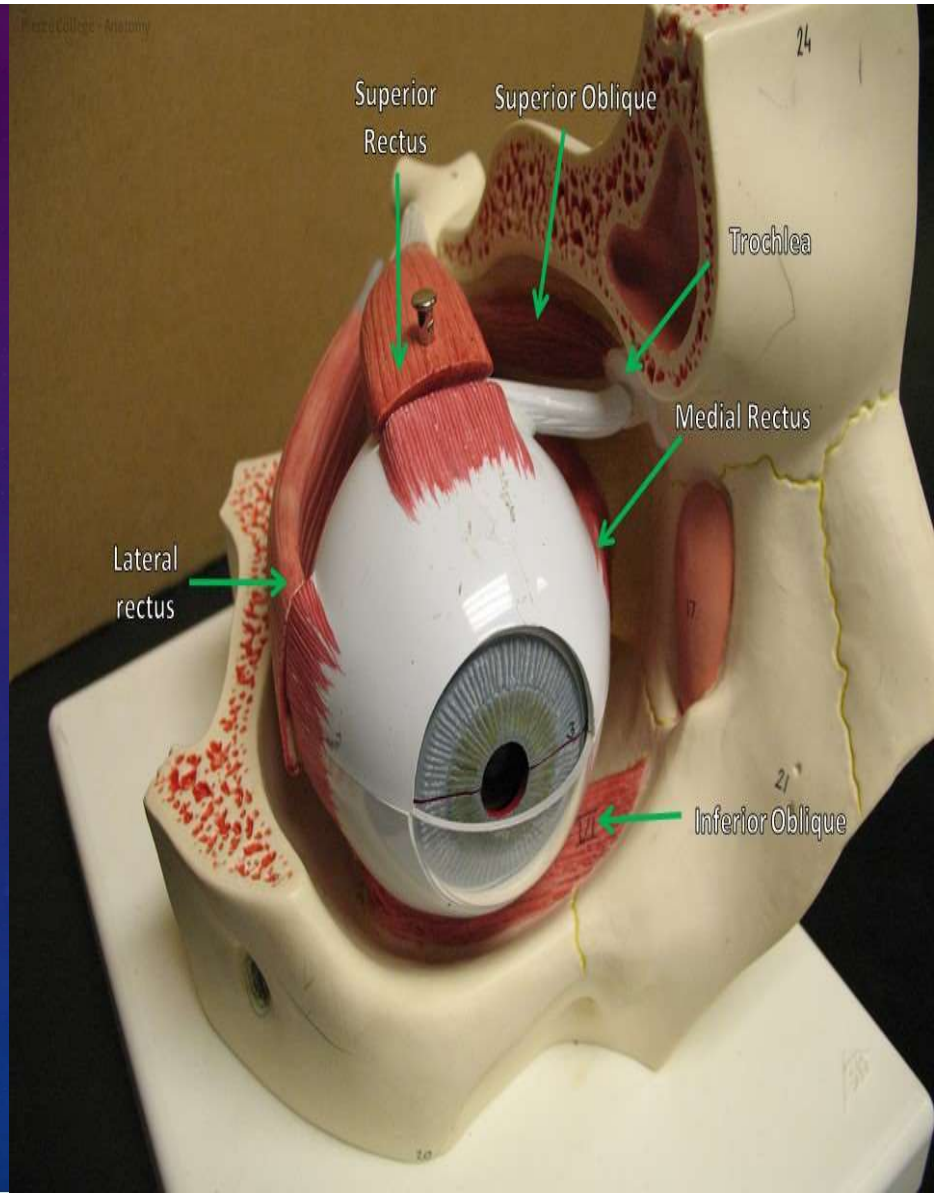
Note: arrows indicate direction of eye movement produced by each muscle

MUSCLE	ACTION
Superior rectus	Upwards and medially
Inferior rectus	Downards and medially
Medial rectus	Medial movement (adduction)
Lateral rectus	Lateral movement (abduction)




Zygomatic
Bone


Superior Oblique m.
Medial Rectus m.
Frontal Sinus
Superior Rectus
Sclera
Cornea
Lateral Rectus m.
Dorsal/Superior Rectus m
Optic Nerve
Zygomatic Bone


Superior Rectus
Superior Oblique
Trochlea
Medial Rectus
Lateral rectus
Inferior Oblique

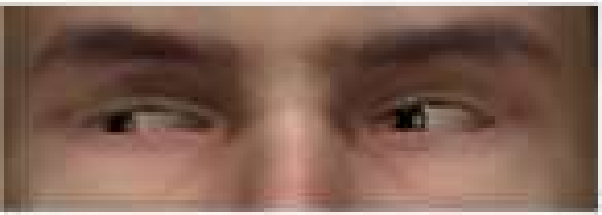
Right and Up

Up

Left and Up

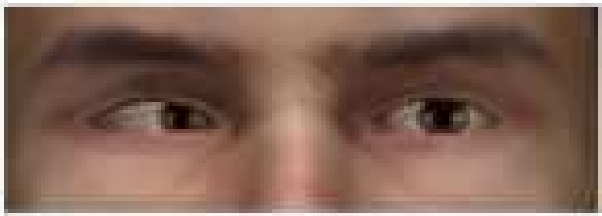
Which eye muscle involved?

Right

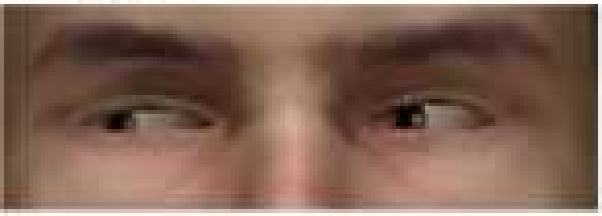


Primary Position

Left

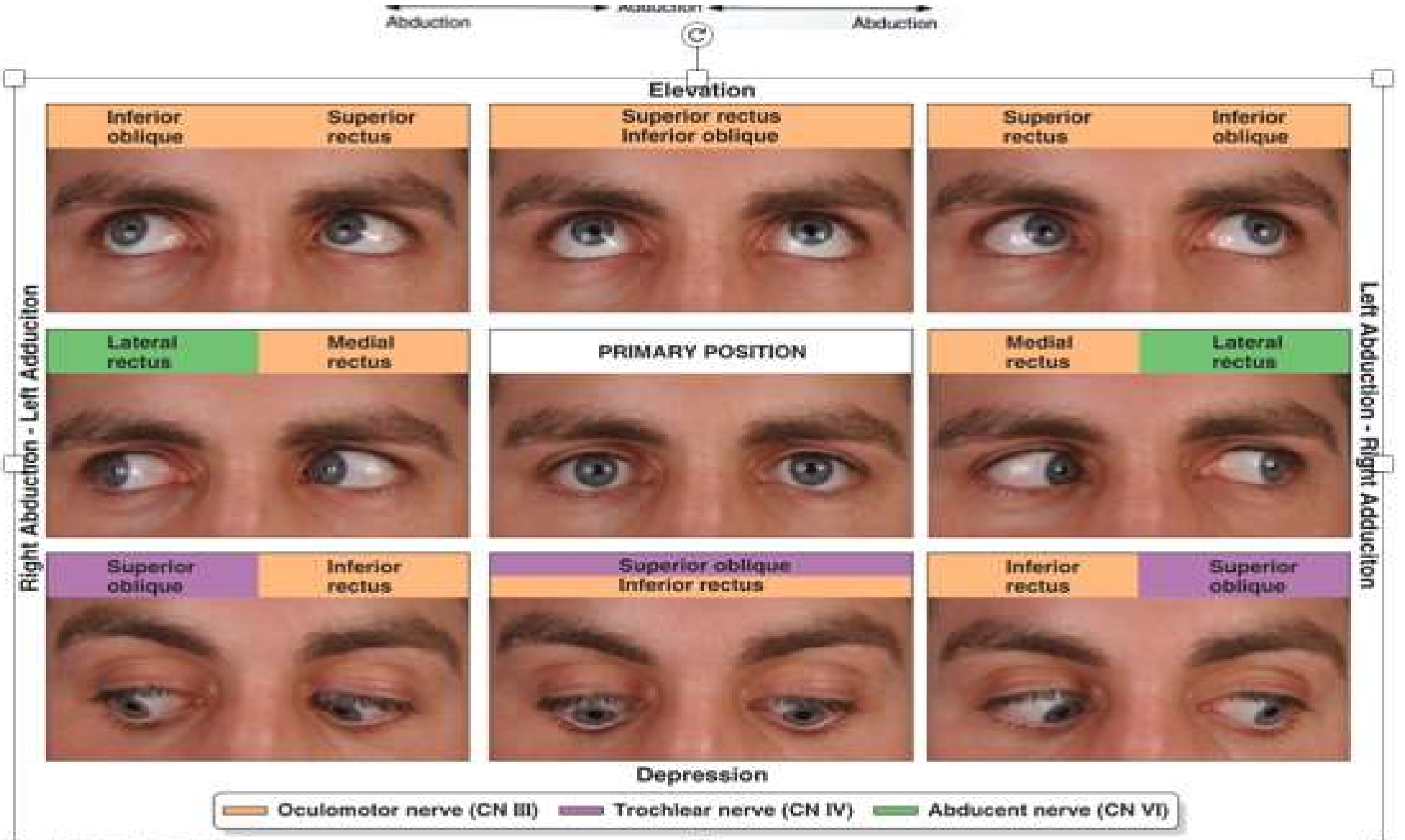


Right and Down



Down

Left and Down

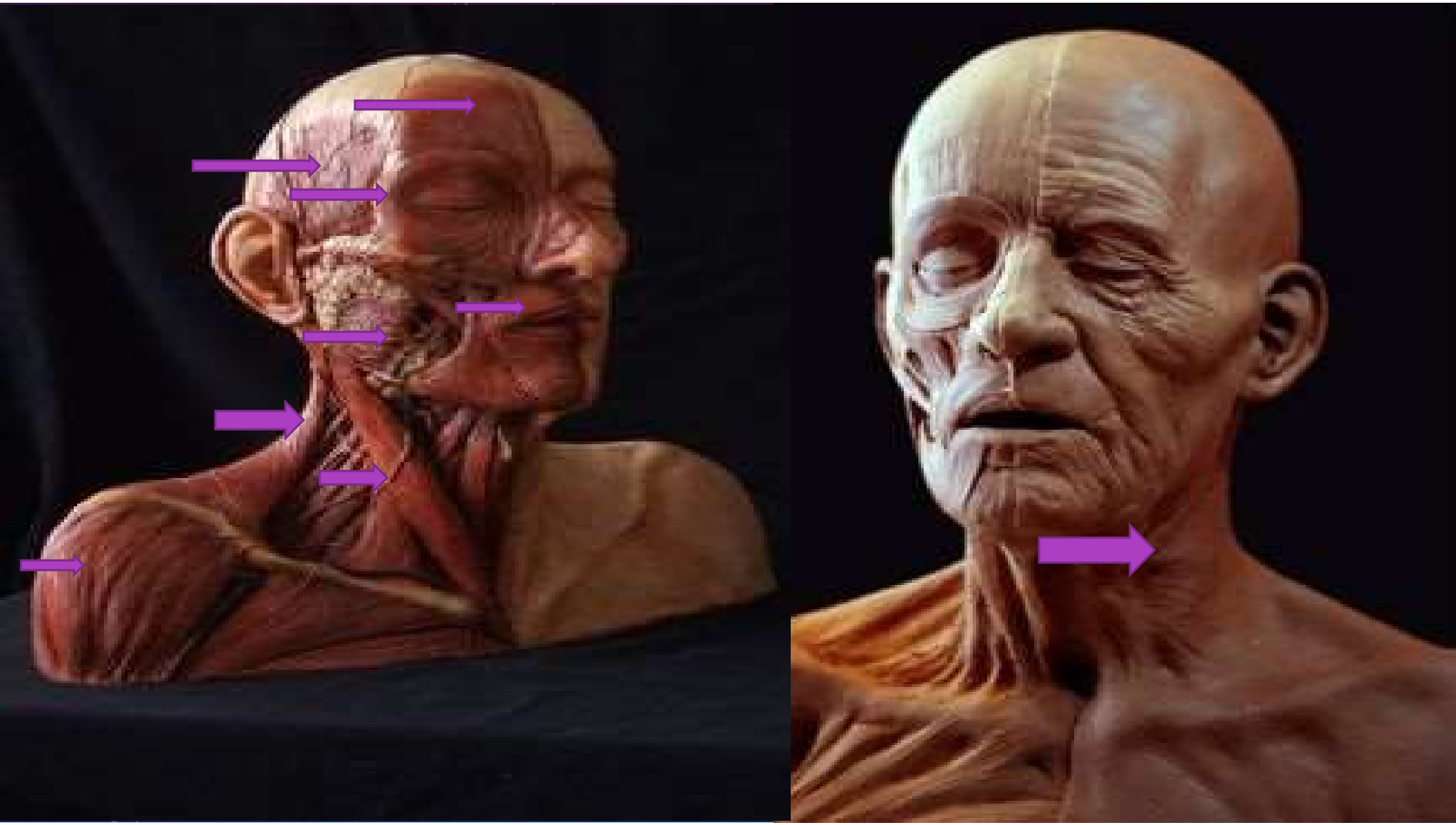

Abduction
Abduction
Elevation
Inferior oblique
Superior rectus
Superior rectus
Inferior oblique
Superior rectus
Inferior oblique
Lateral rectus
Medial rectus
PRIMARY POSITION
Medial rectus
Lateral rectus
Superior oblique
Inferior rectus
Superior oblique
Inferior rectus
Inferior rectus
Superior oblique
Right Abduction - Left Adduction
Left Abduction - Right Adduction
Depression
Oculomotor nerve (CN III)
Trochlear nerve (CN IV)
Abducent nerve (CN VI)

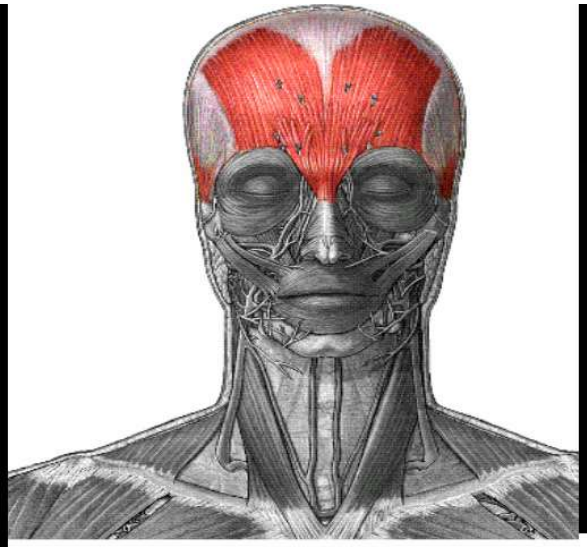

Superior Rectus
Inferior Oblique
Superior Rectus + Inferior Oblique
Inferior Oblique
Superior Rectus
Lateral Rectus
Medial Rectus
Primary Gaze
Medial Rectus
Lateral Rectus
Inferior Rectus
Superior Oblique
Inferior Rectus + Superior Oblique
Superior Oblique
Inferior Rectus

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

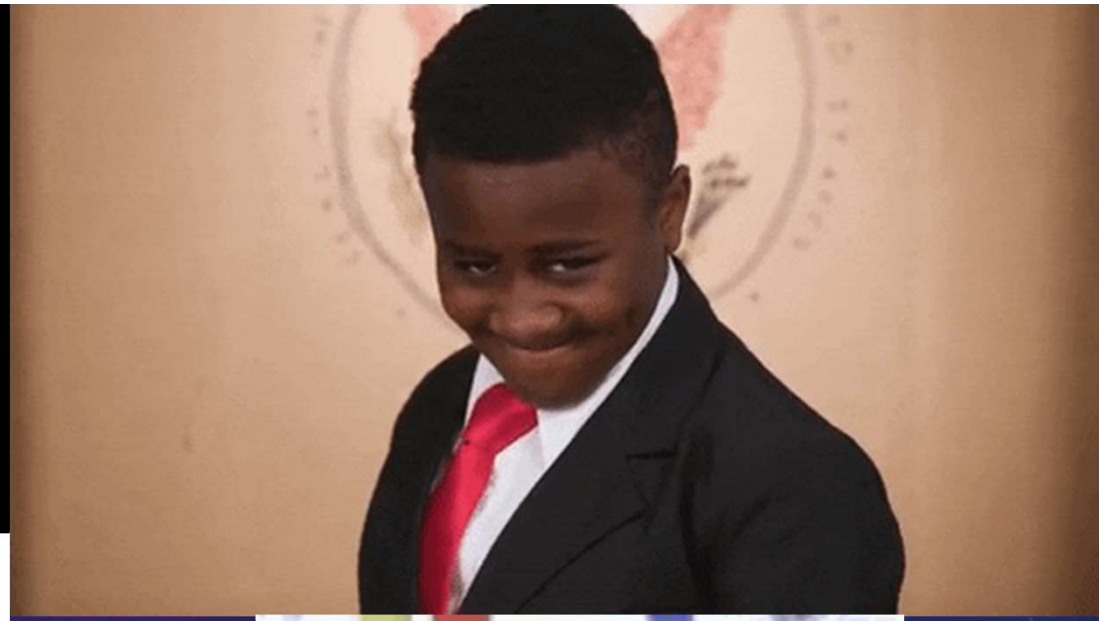
/What muscle is responsible for putting this girl's right eye in its current position?

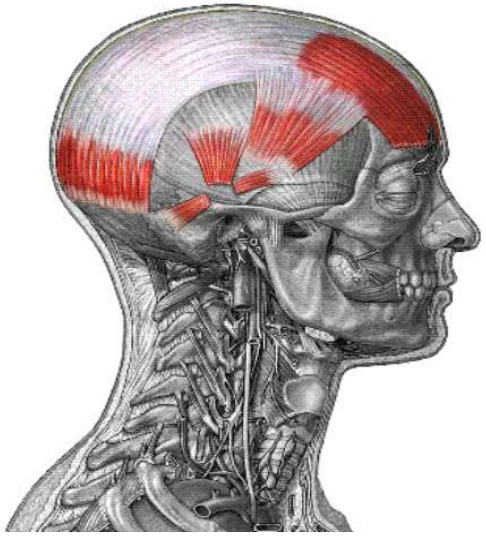
Identify the muscle that raised President Nixon's eyebrows.

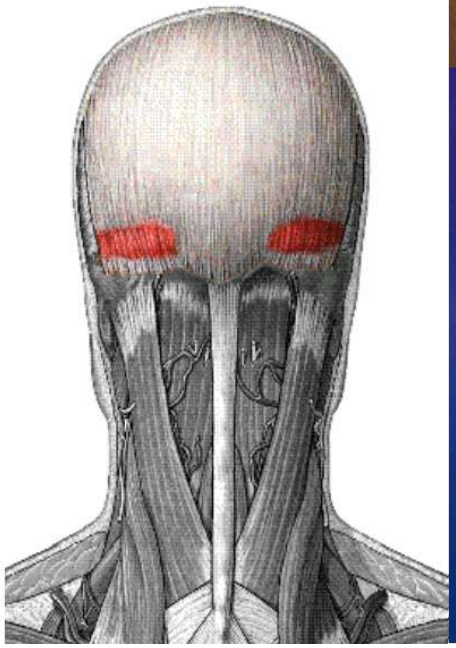


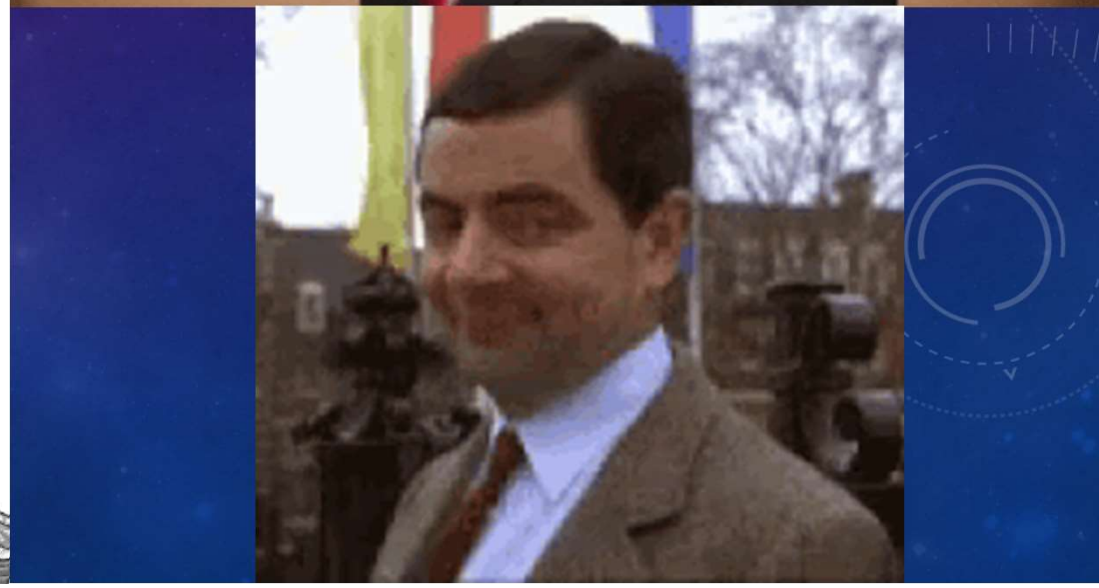


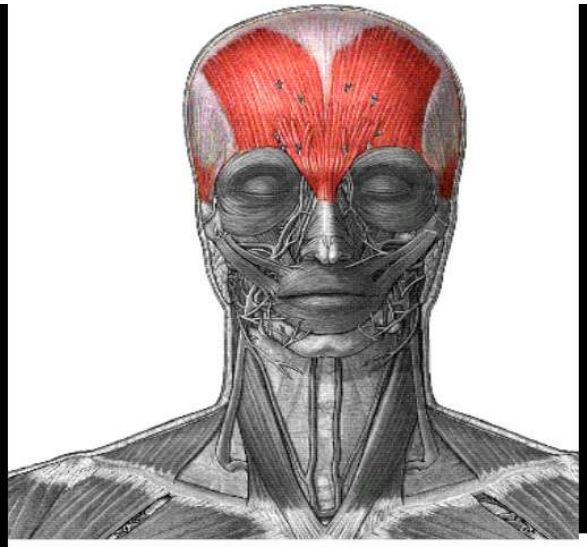
?



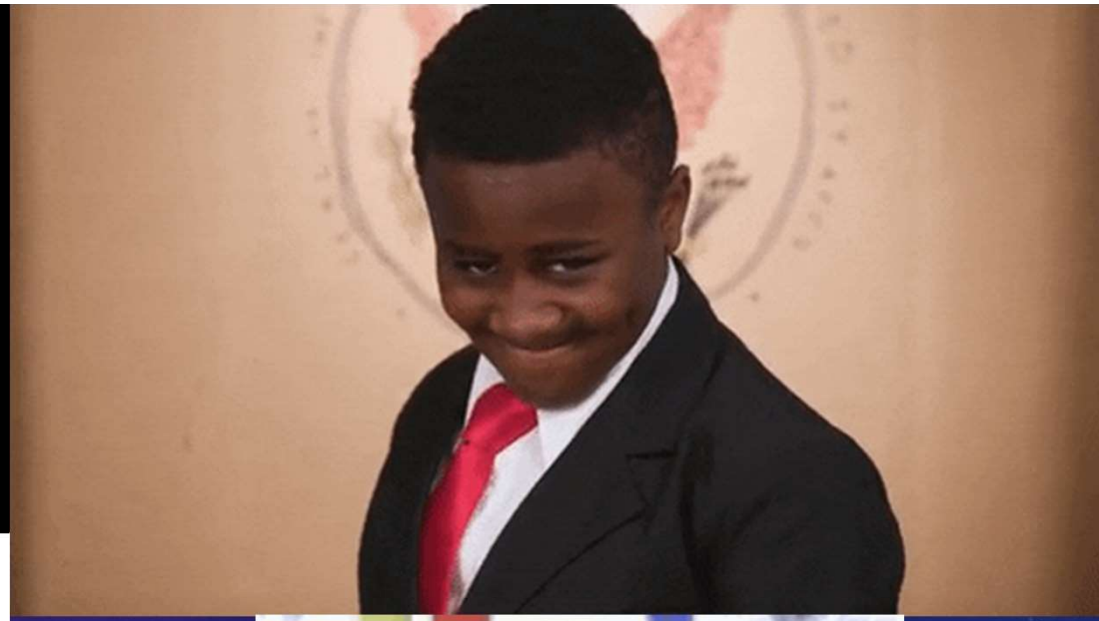


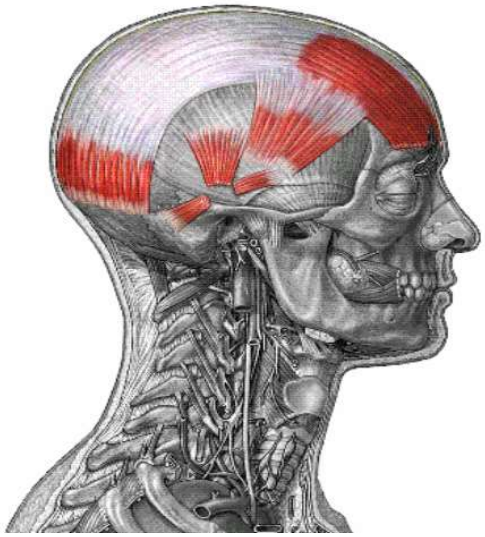


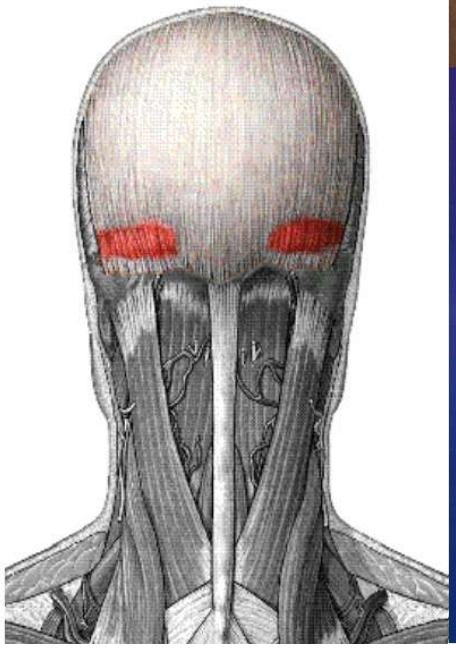


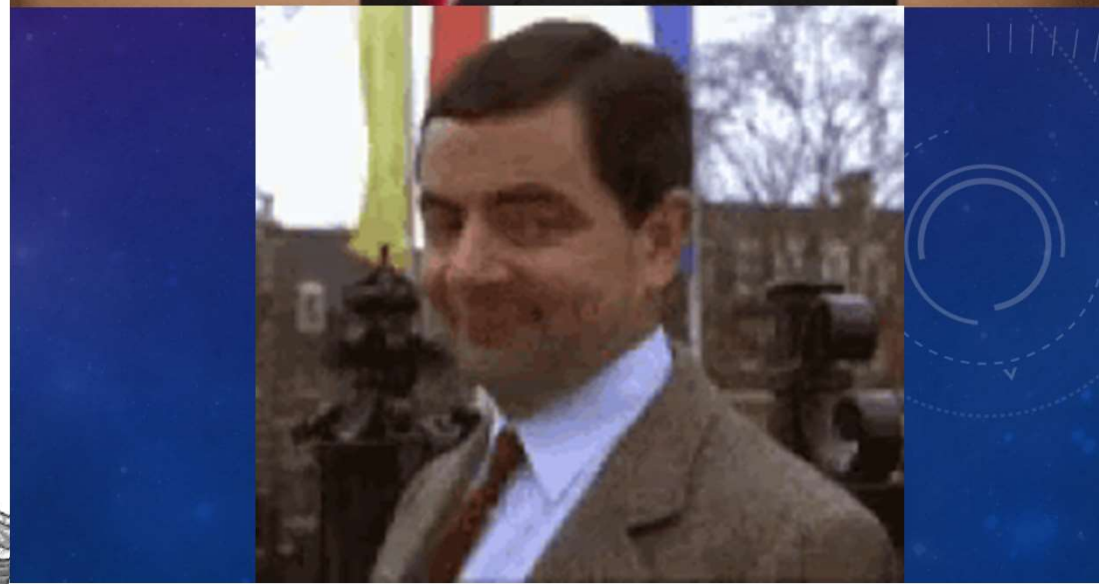


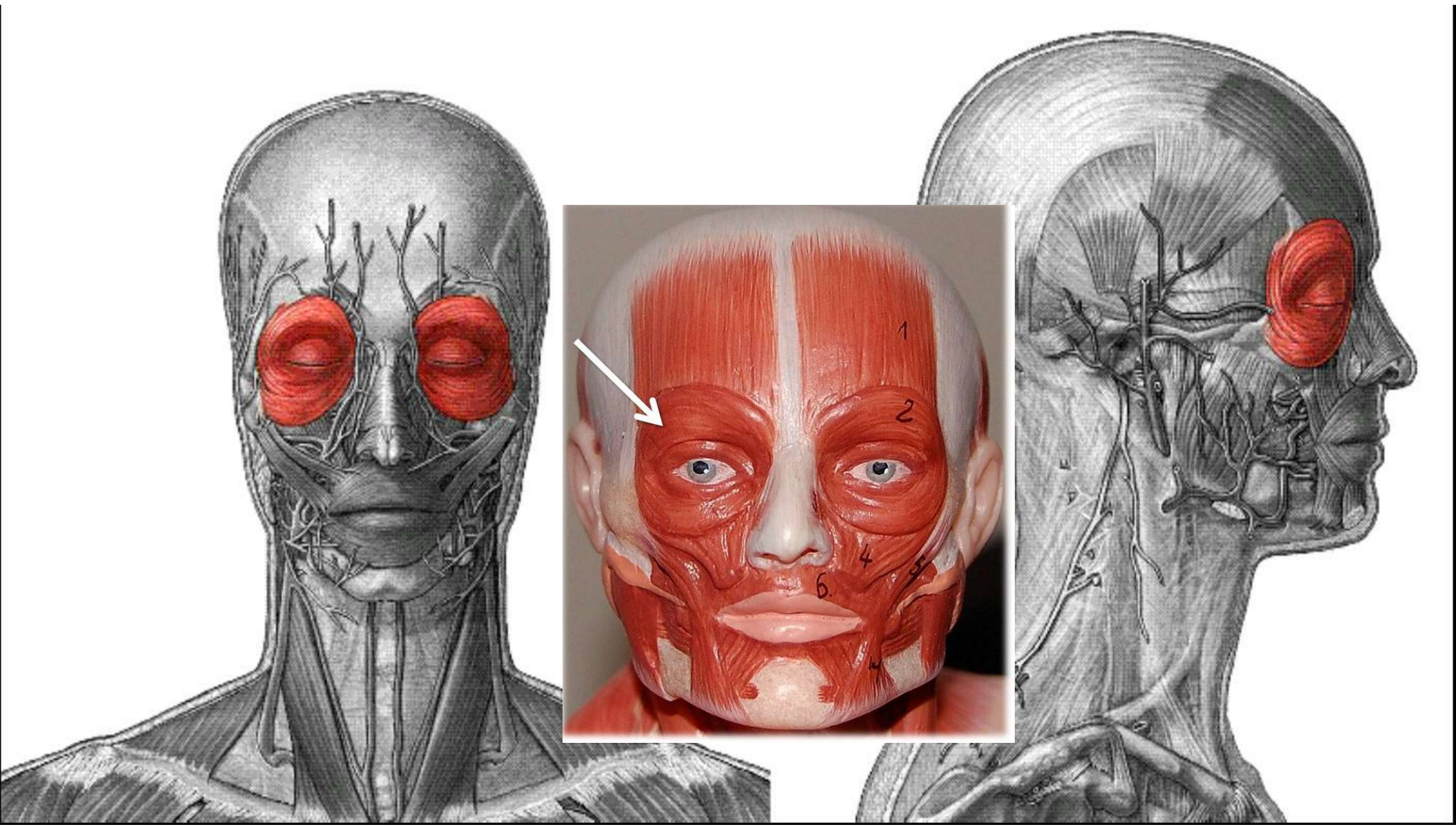
Epicranius.










1
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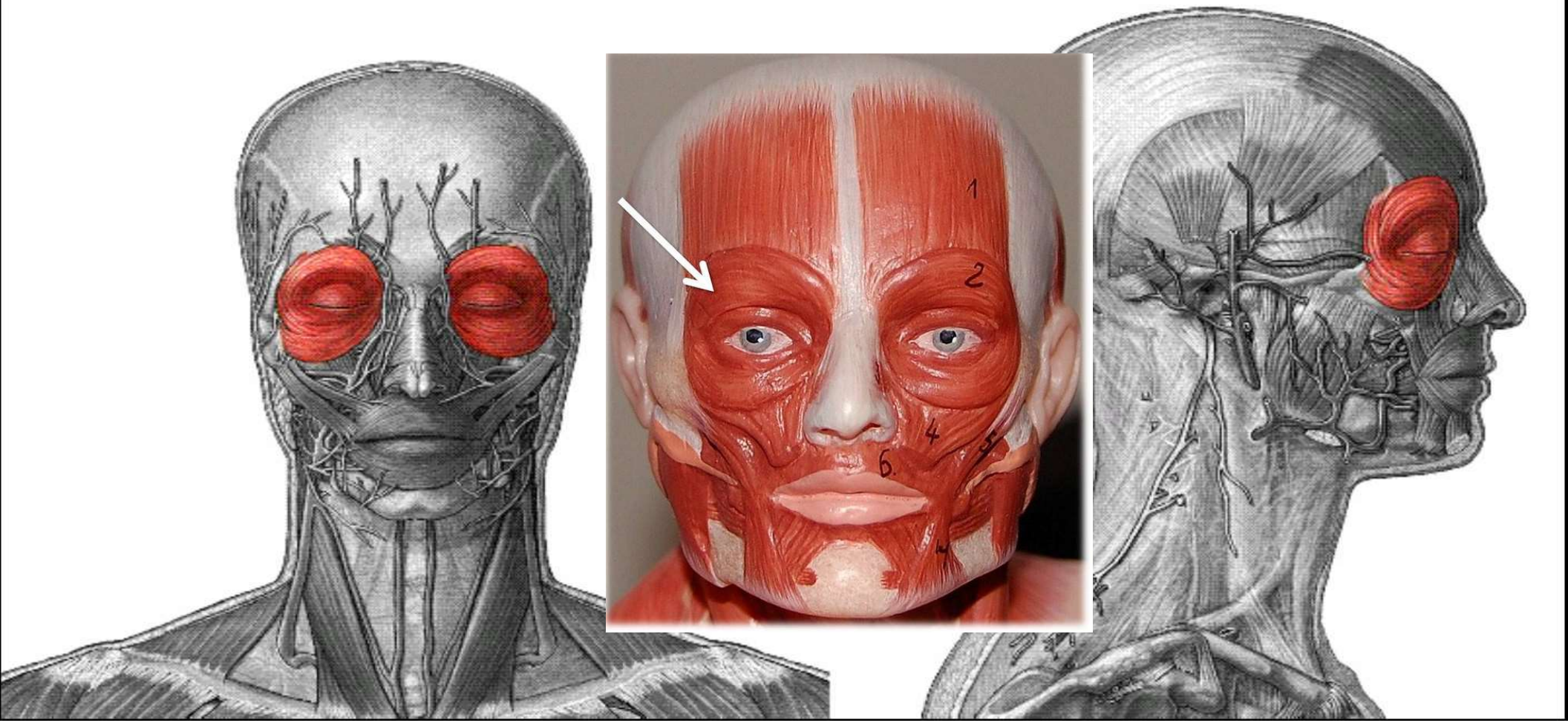
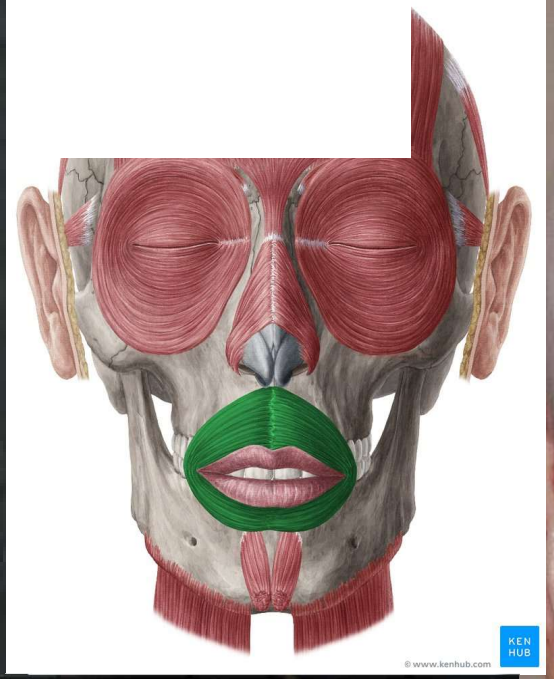
4
6

Orbicularis oculi.

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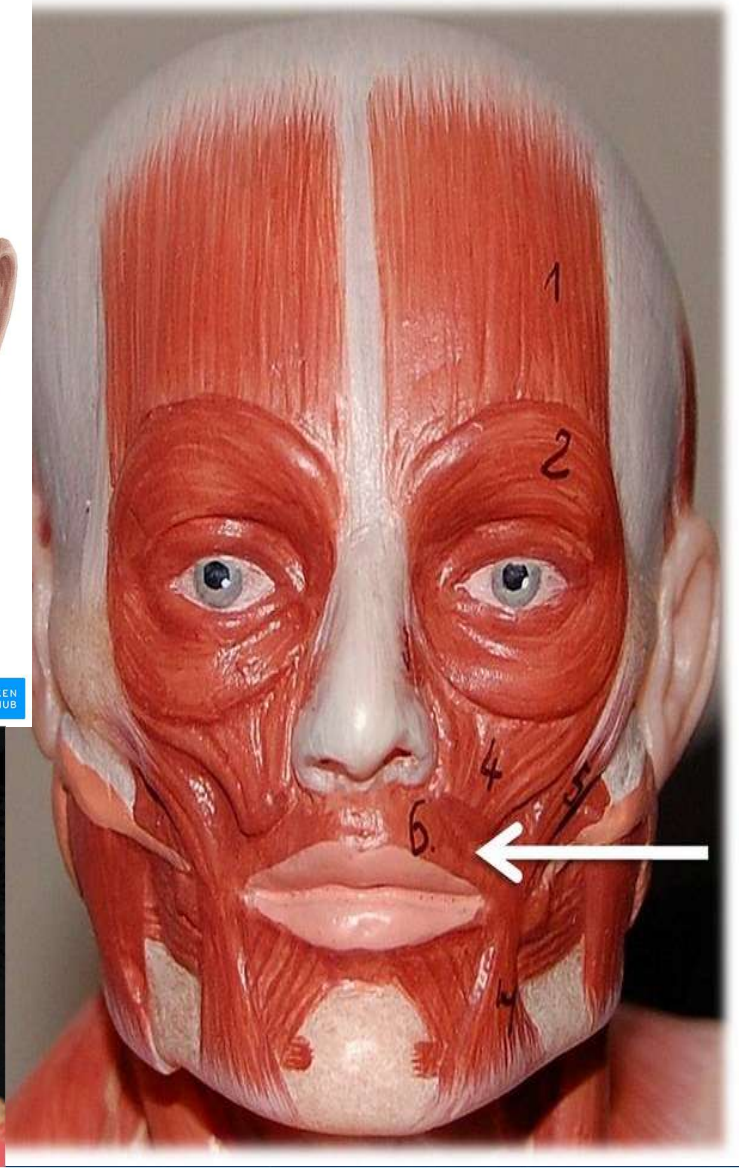
1
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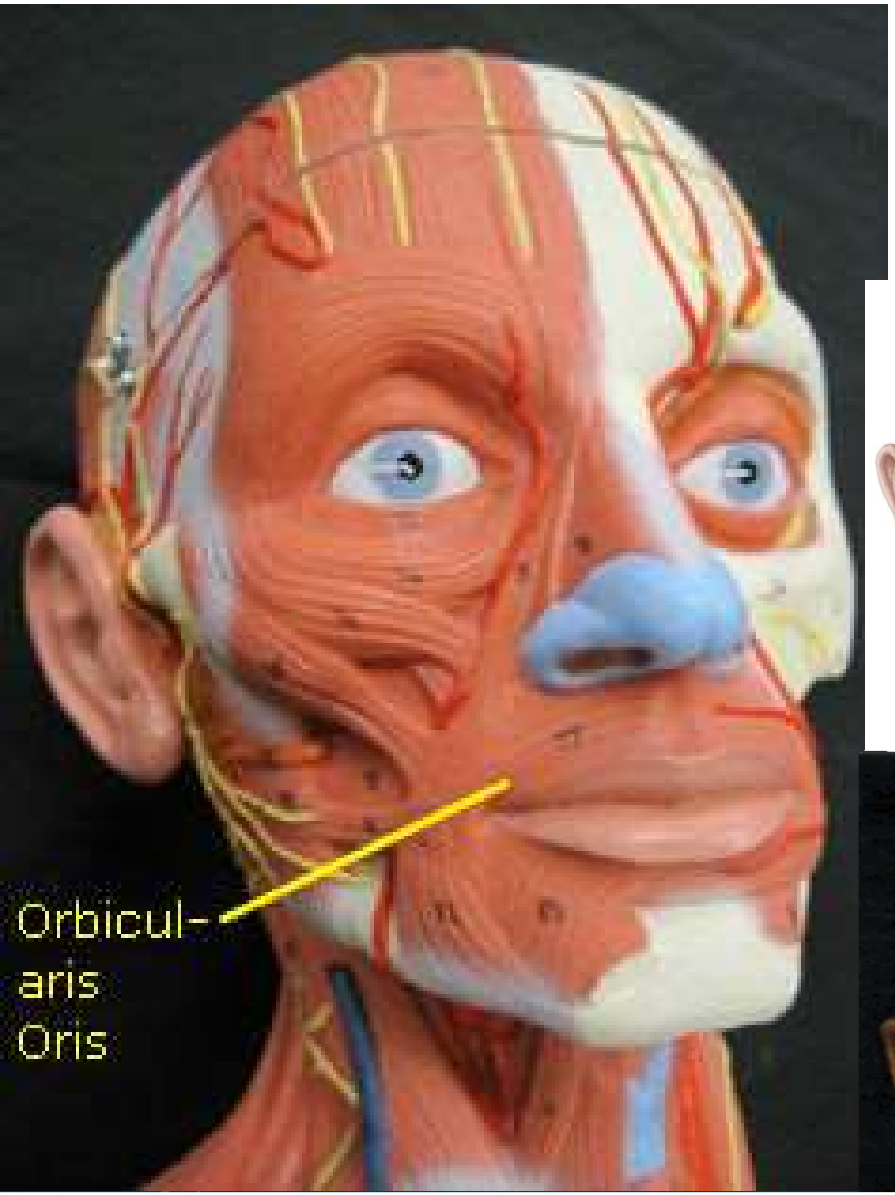
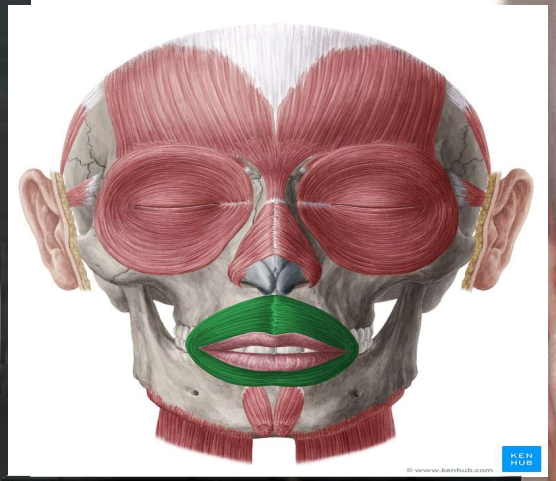
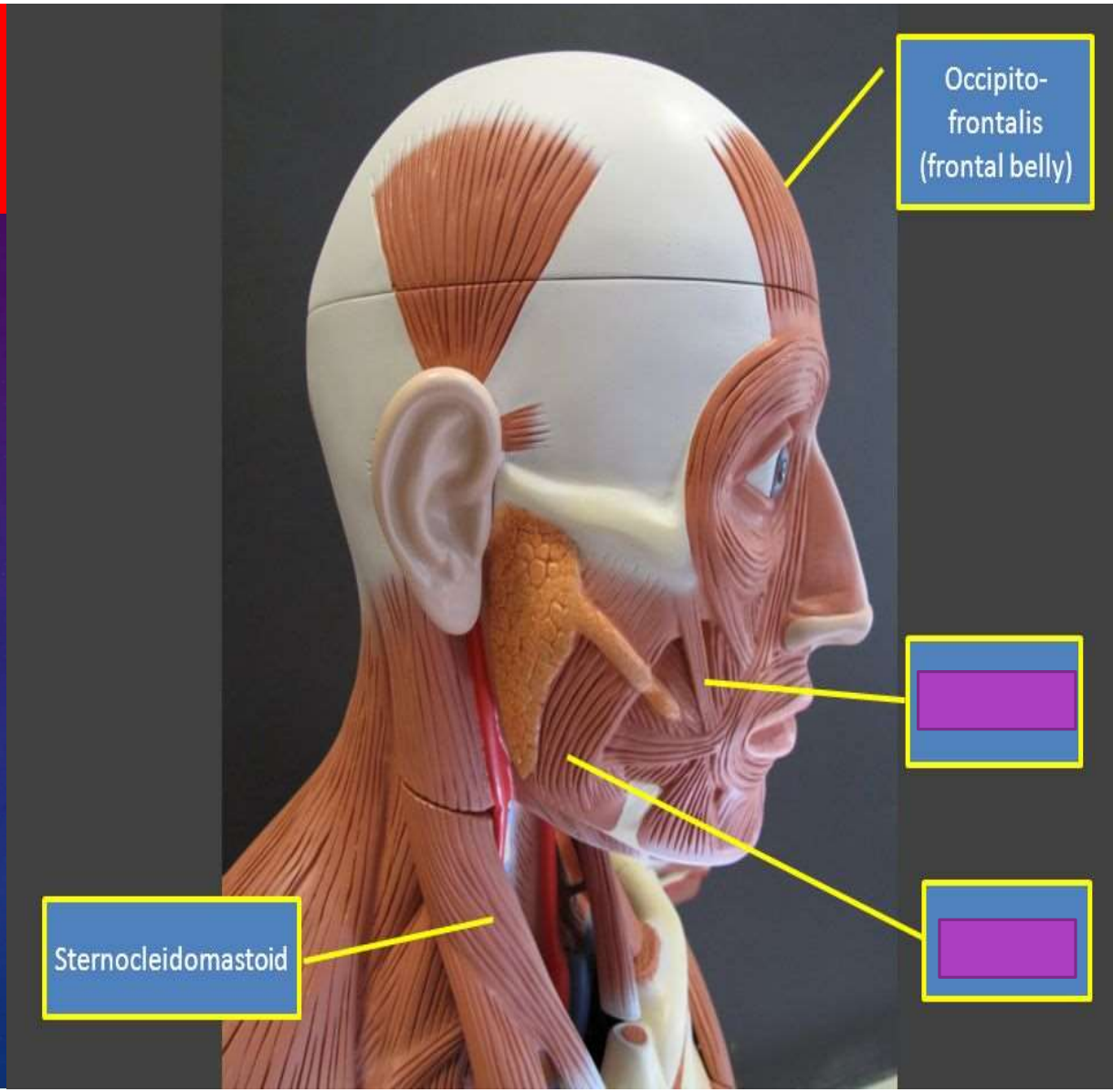
4
6

Orbicularis oris



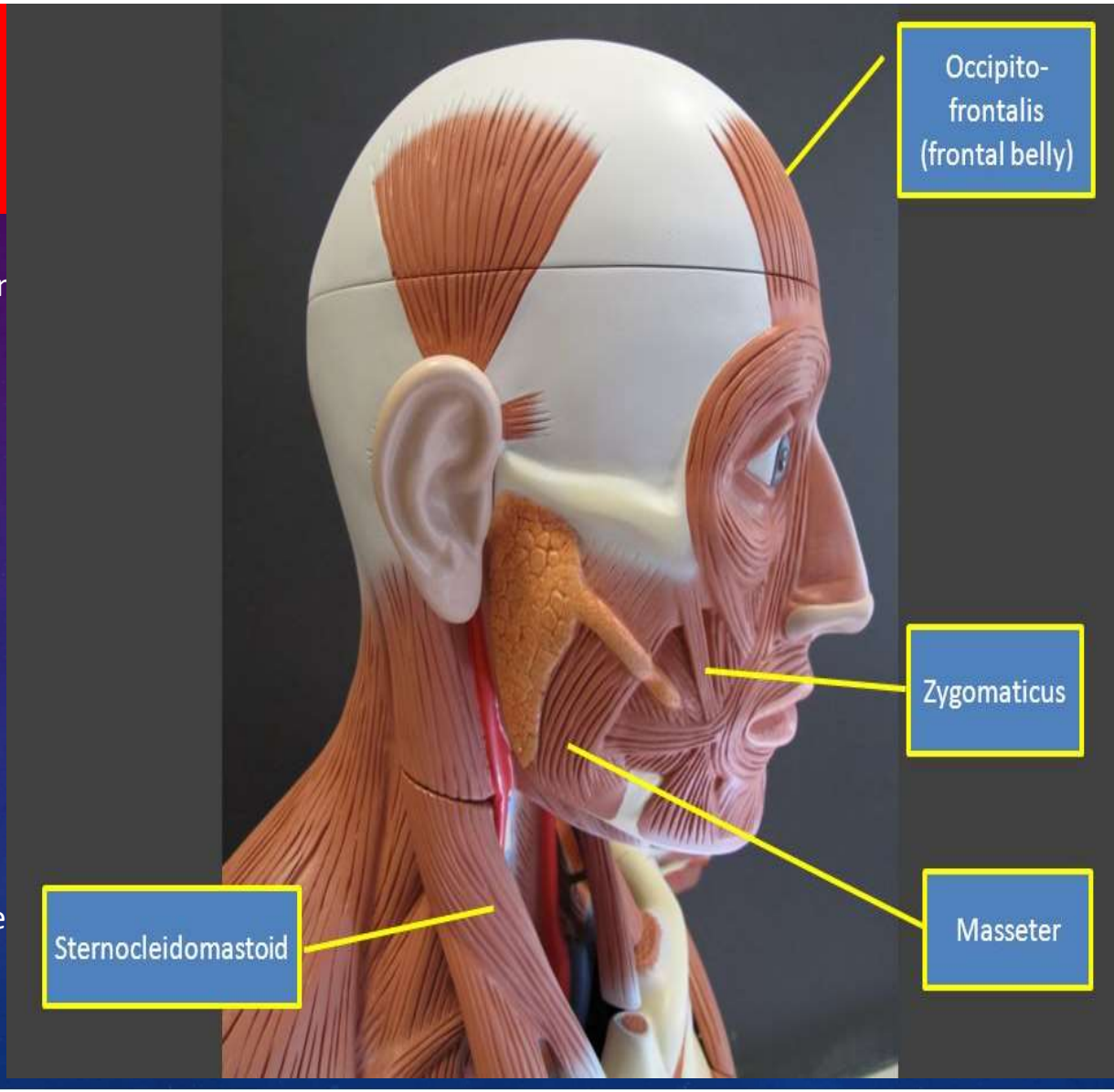


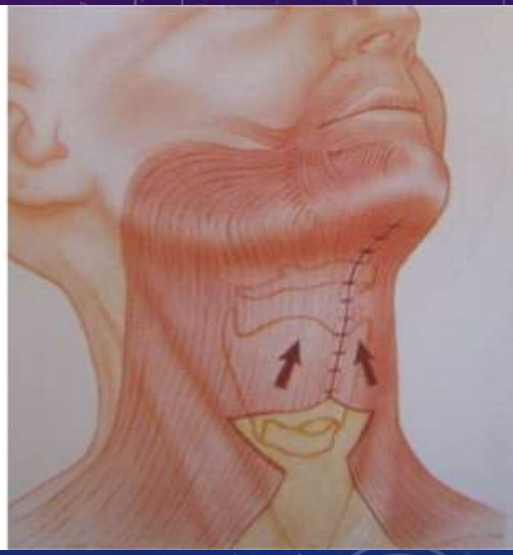
MUSCLES OF MASTICATION?



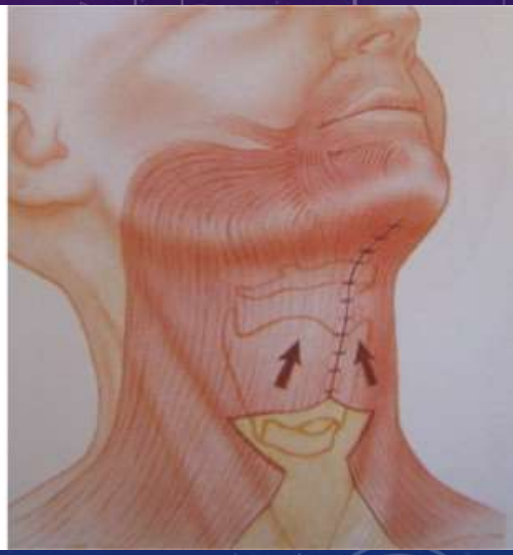
MUSCLES OF MASTICATION

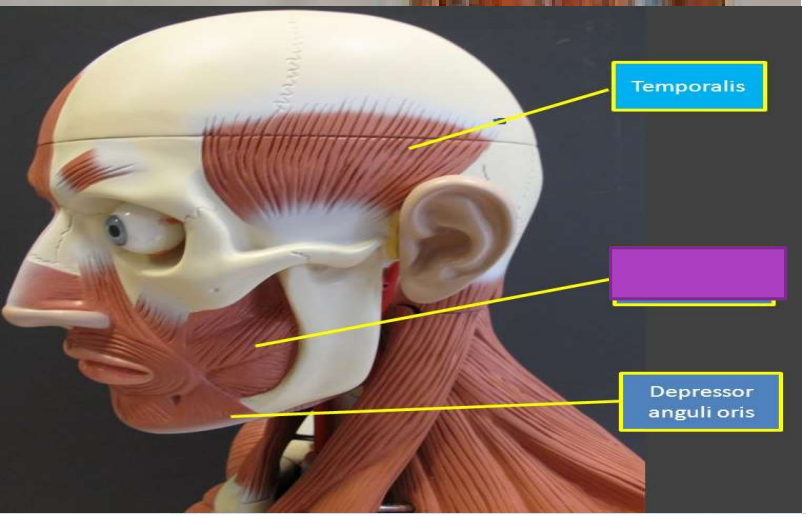
- There are four pairs of muscles involved in mastication
  - Prime movers – temporalis and masseter
    - Grinding movements – pterygoids and buccinators
- All are innervated by cranial nerve V (trigeminal nerve

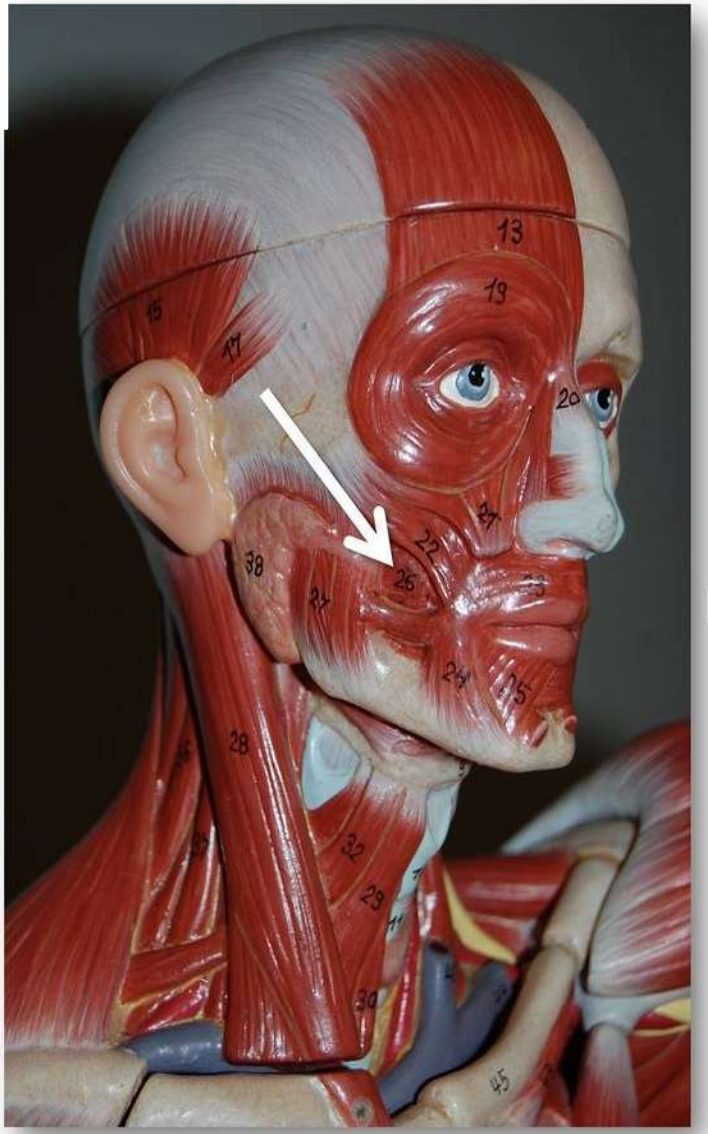




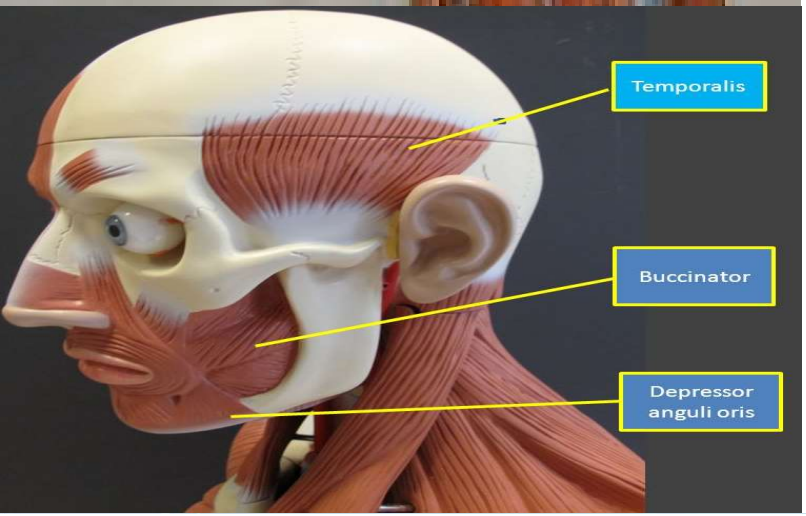
PLATYSMA



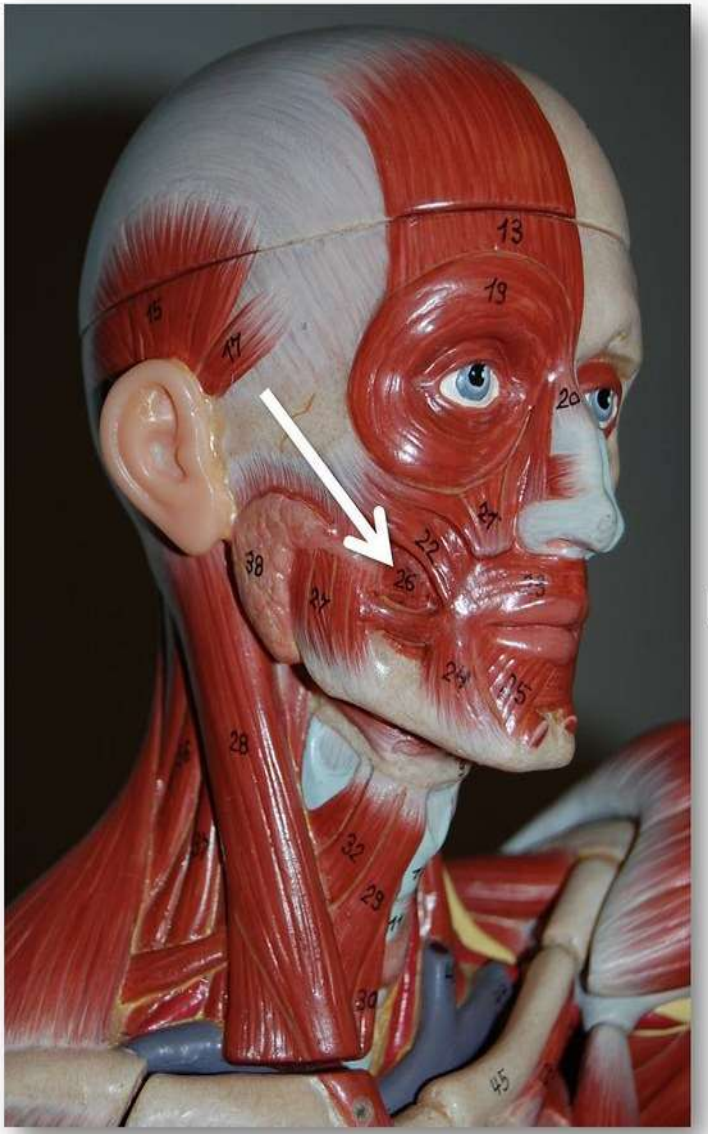




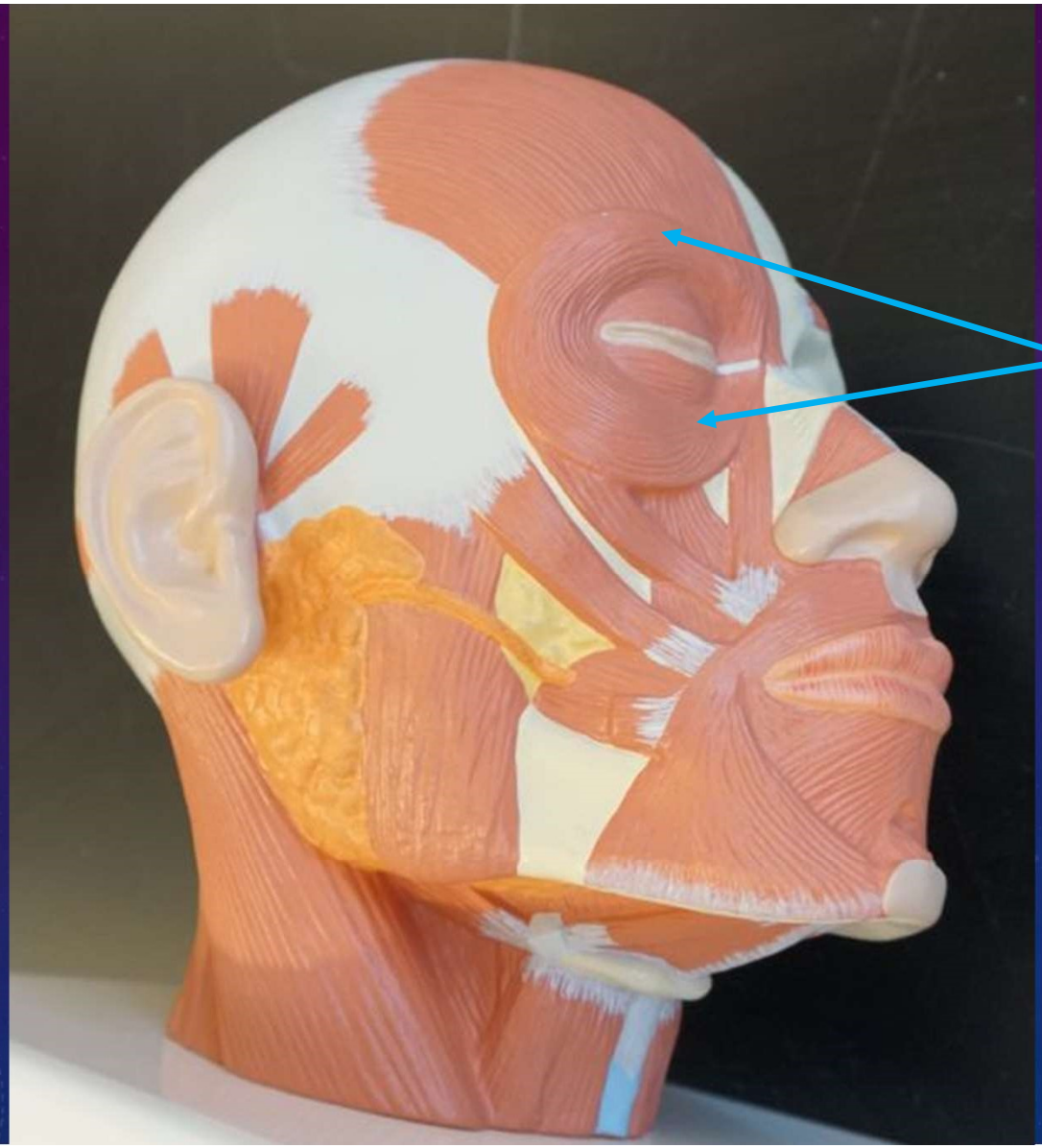
Draws angles of mouth laterally; compresses cheek; used to create sucking action



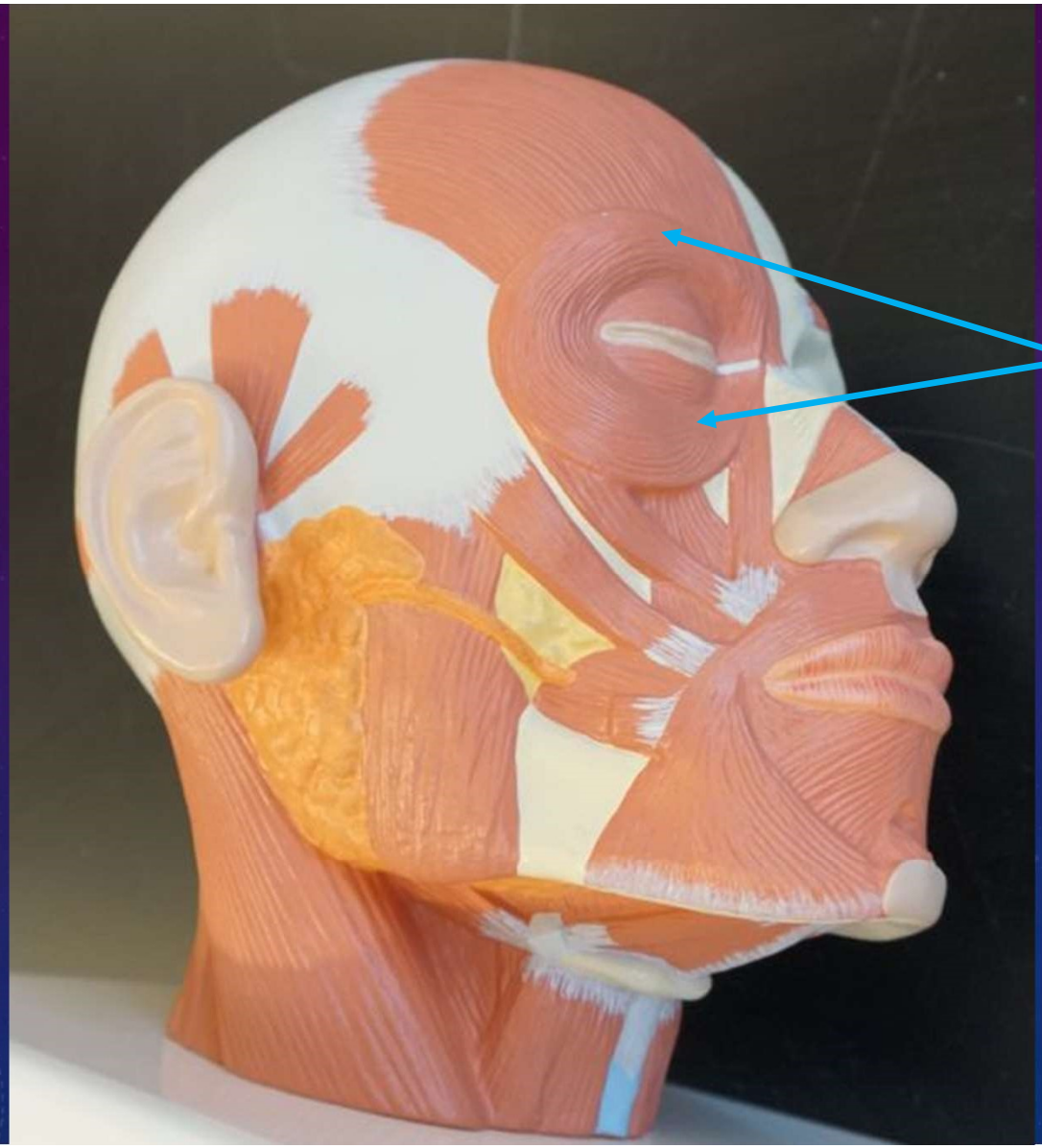
Buccinator



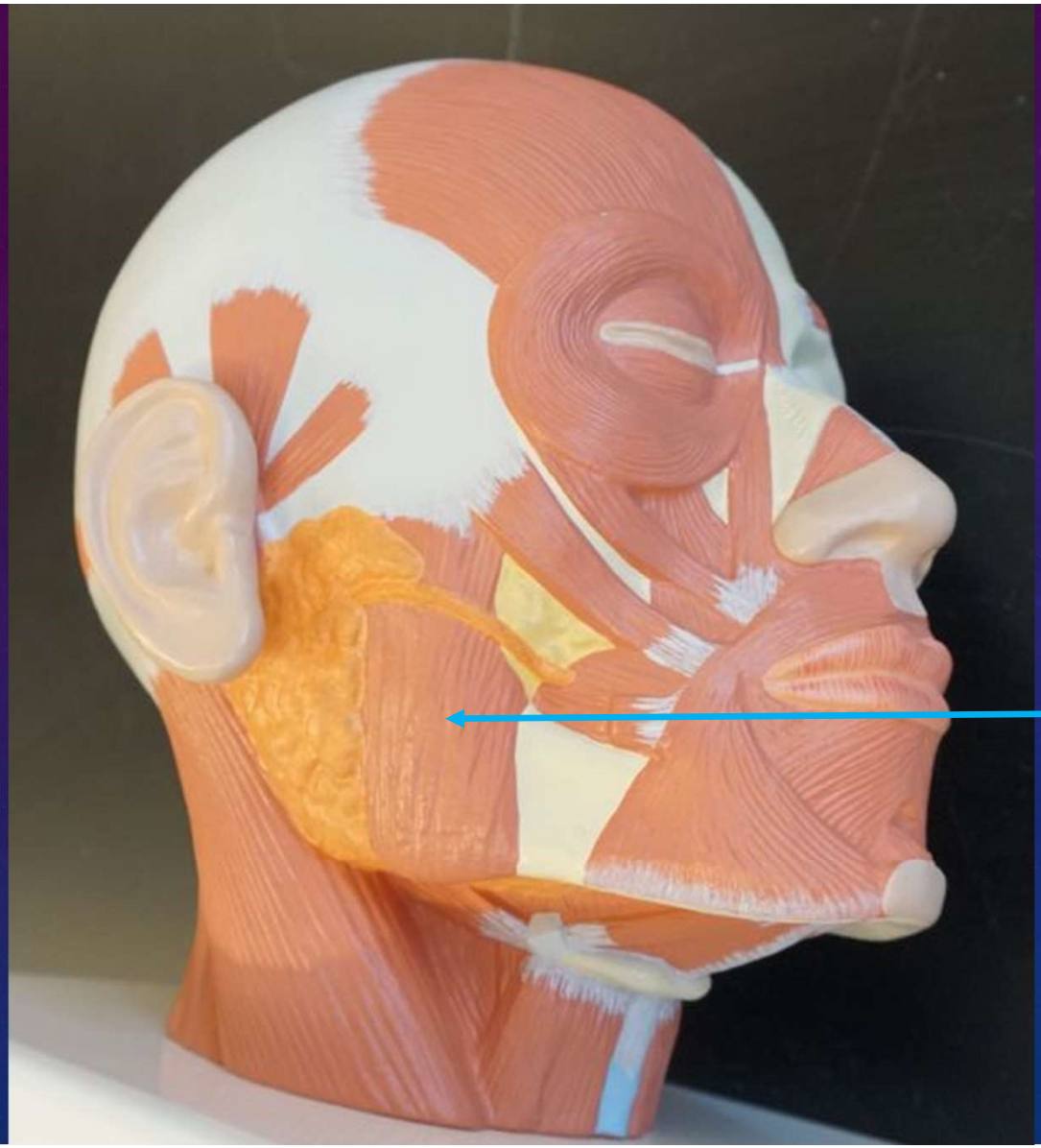
Draws angles of mouth laterally; compresses cheek; used to create sucking action



*click to the next slide to check your answer

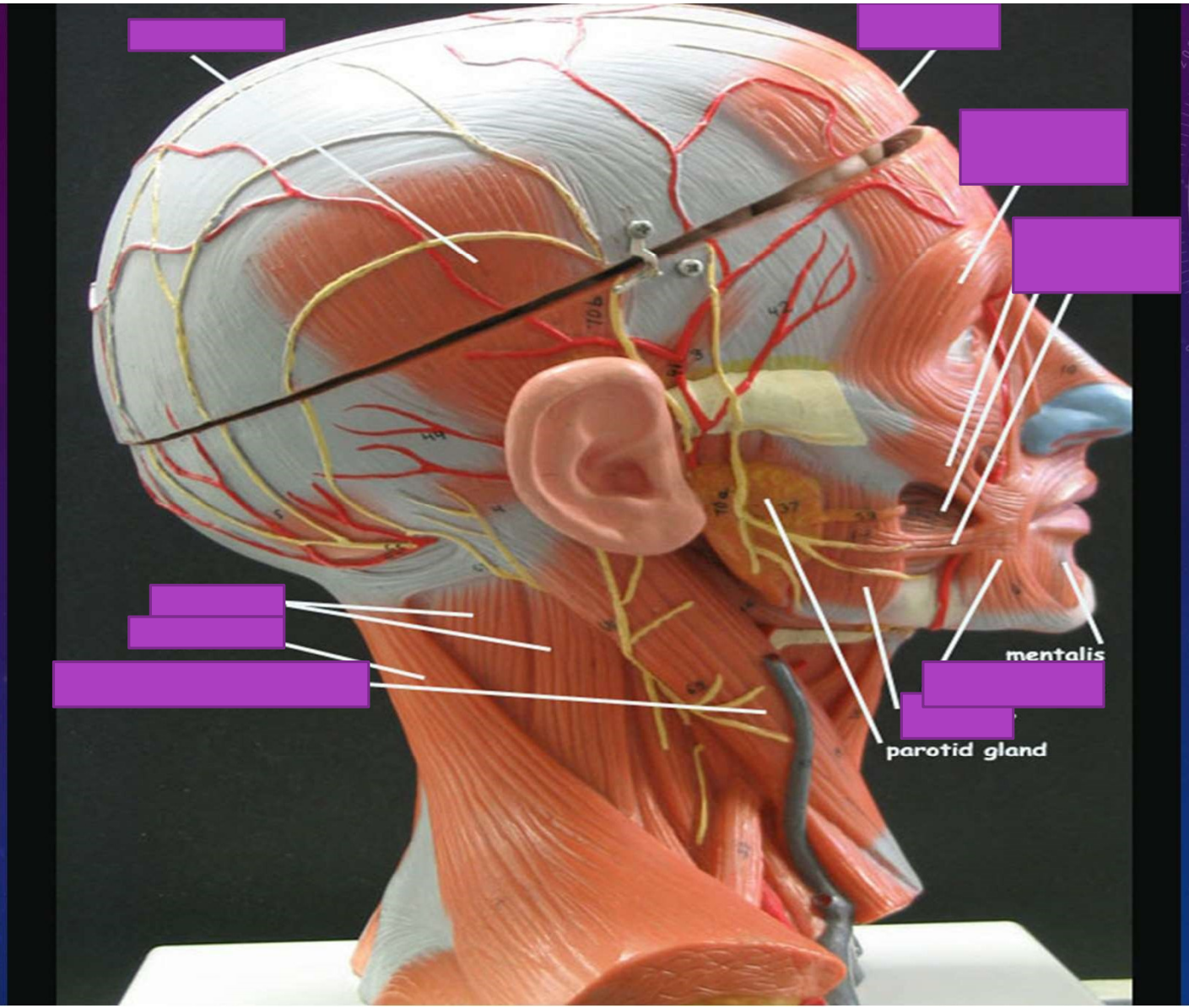


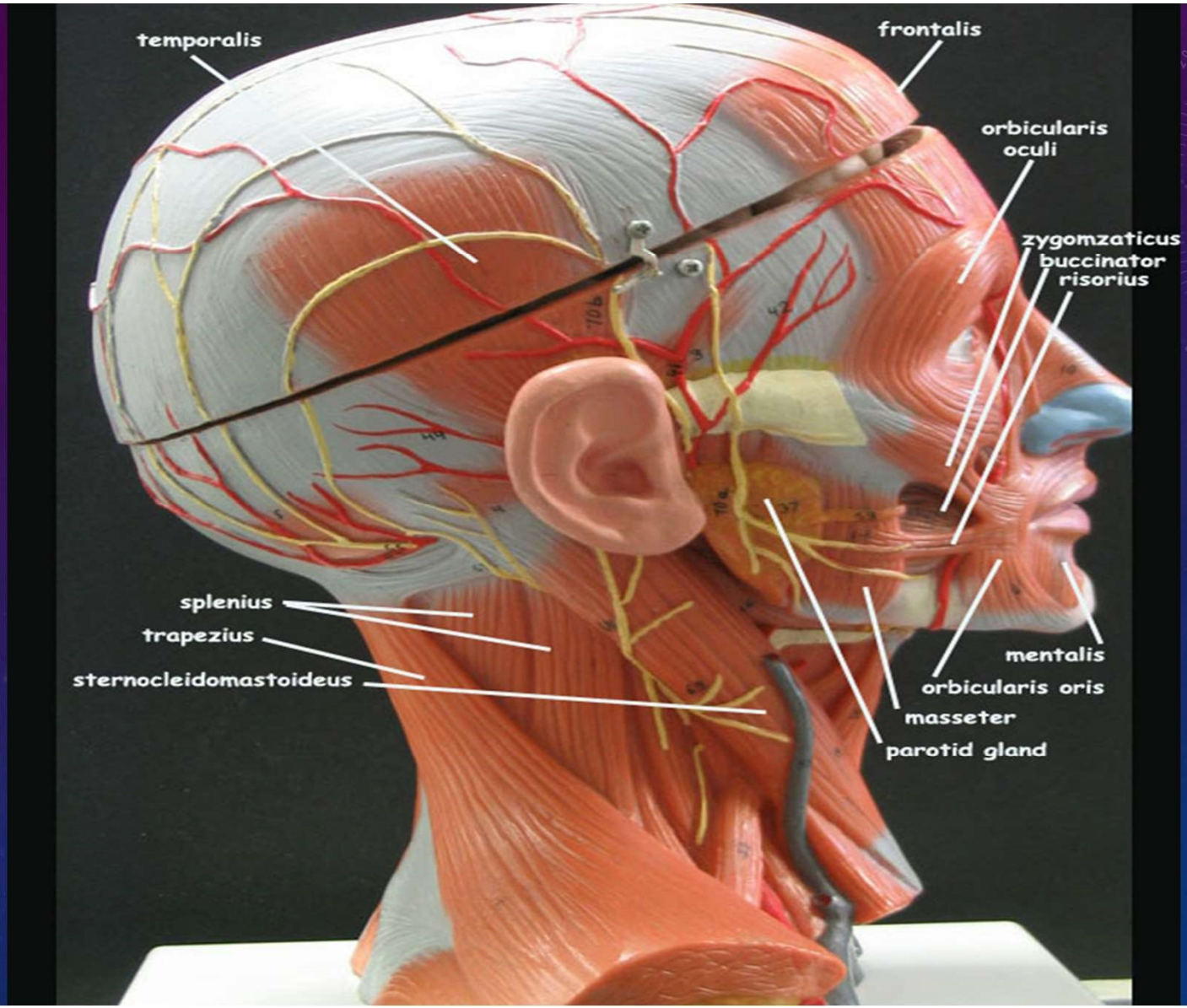
Action: Closes eye/squeezes eye shut

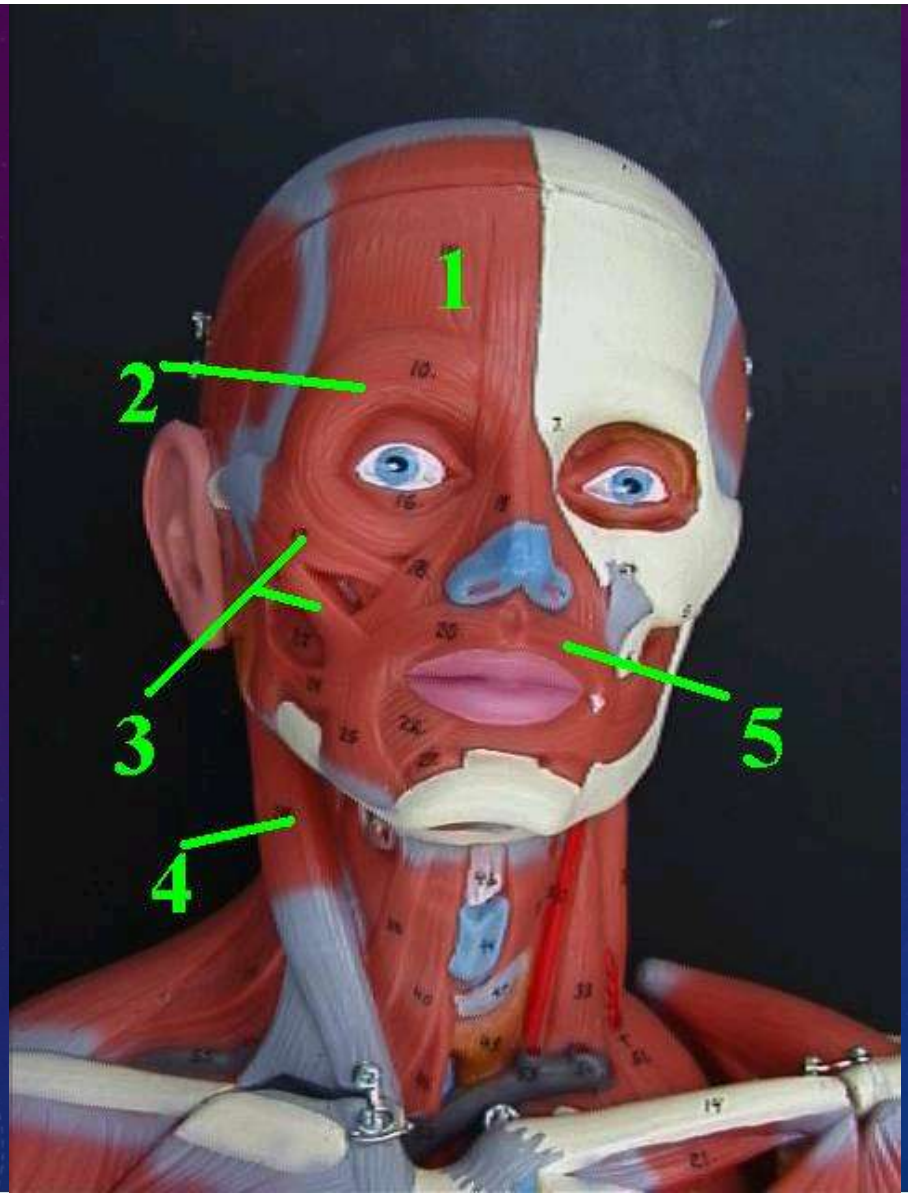


*click to the next slide to check your answer

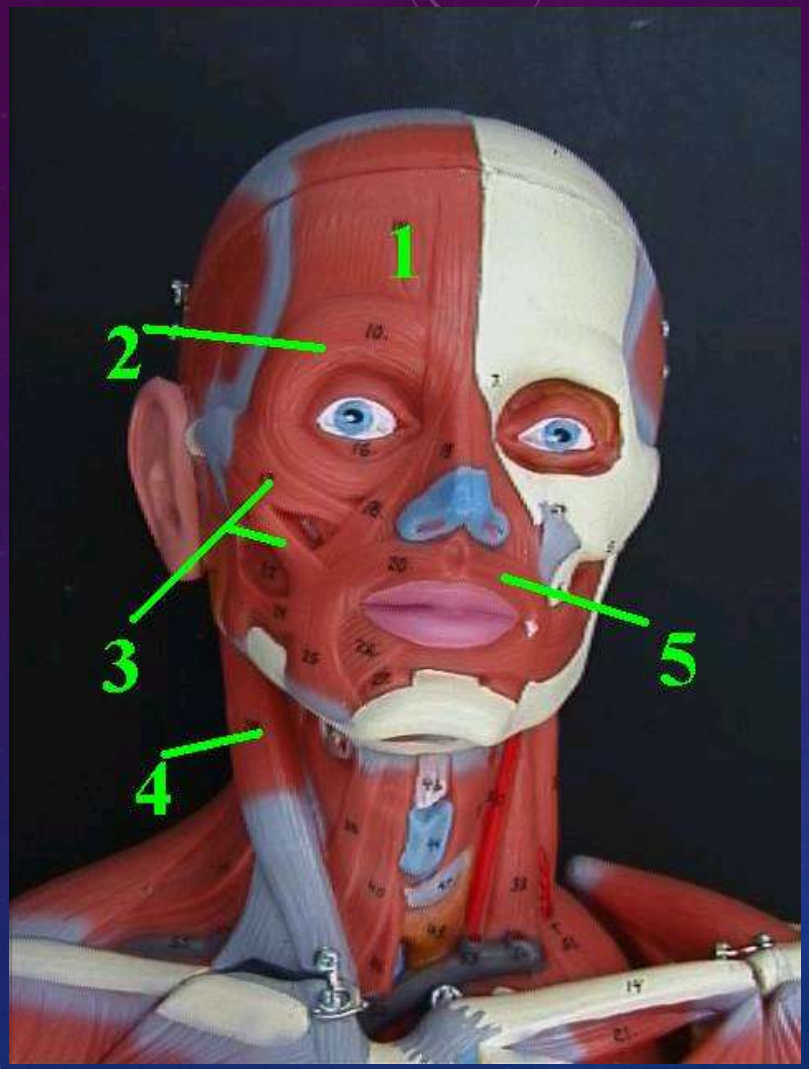
Action: Elevates mandible


mentalis
parotid gland

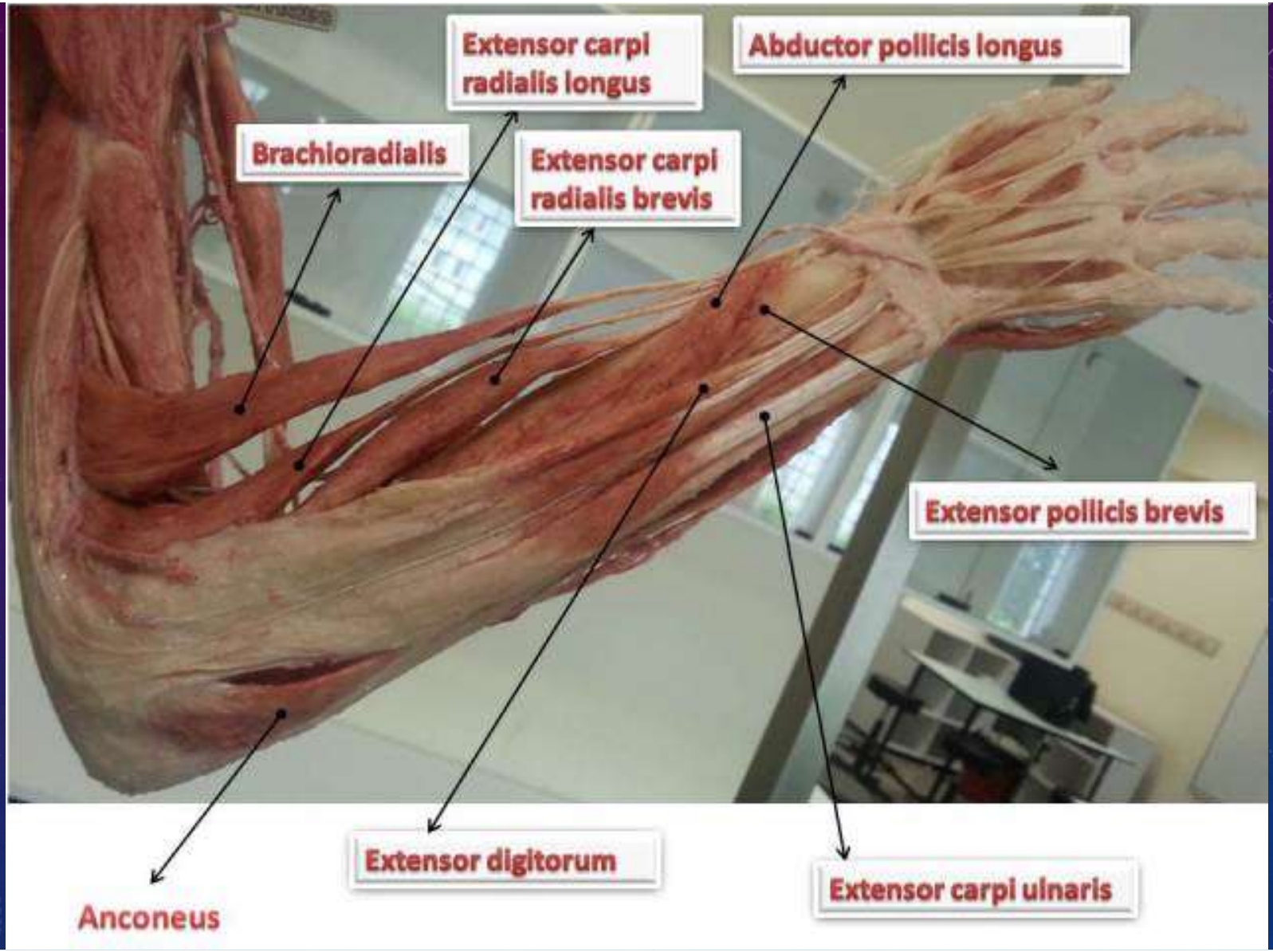

temporalis
frontalis
orbicularis oculi
zygomzaticus
buccinator
risorius
splenius
trapezius
sternocleidomastoideus
mentalis
orbicularis oris
masseter
parotid gland

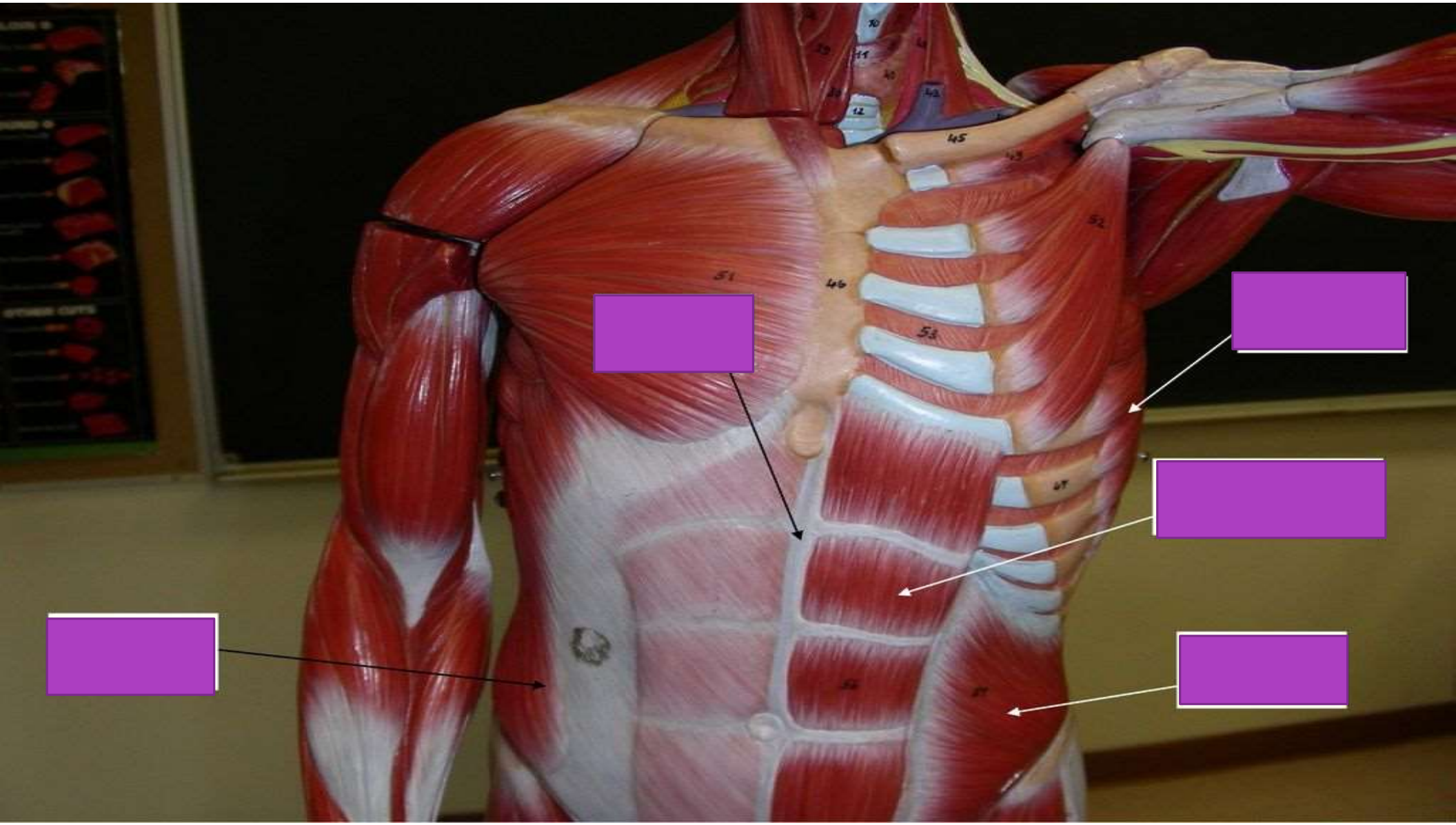


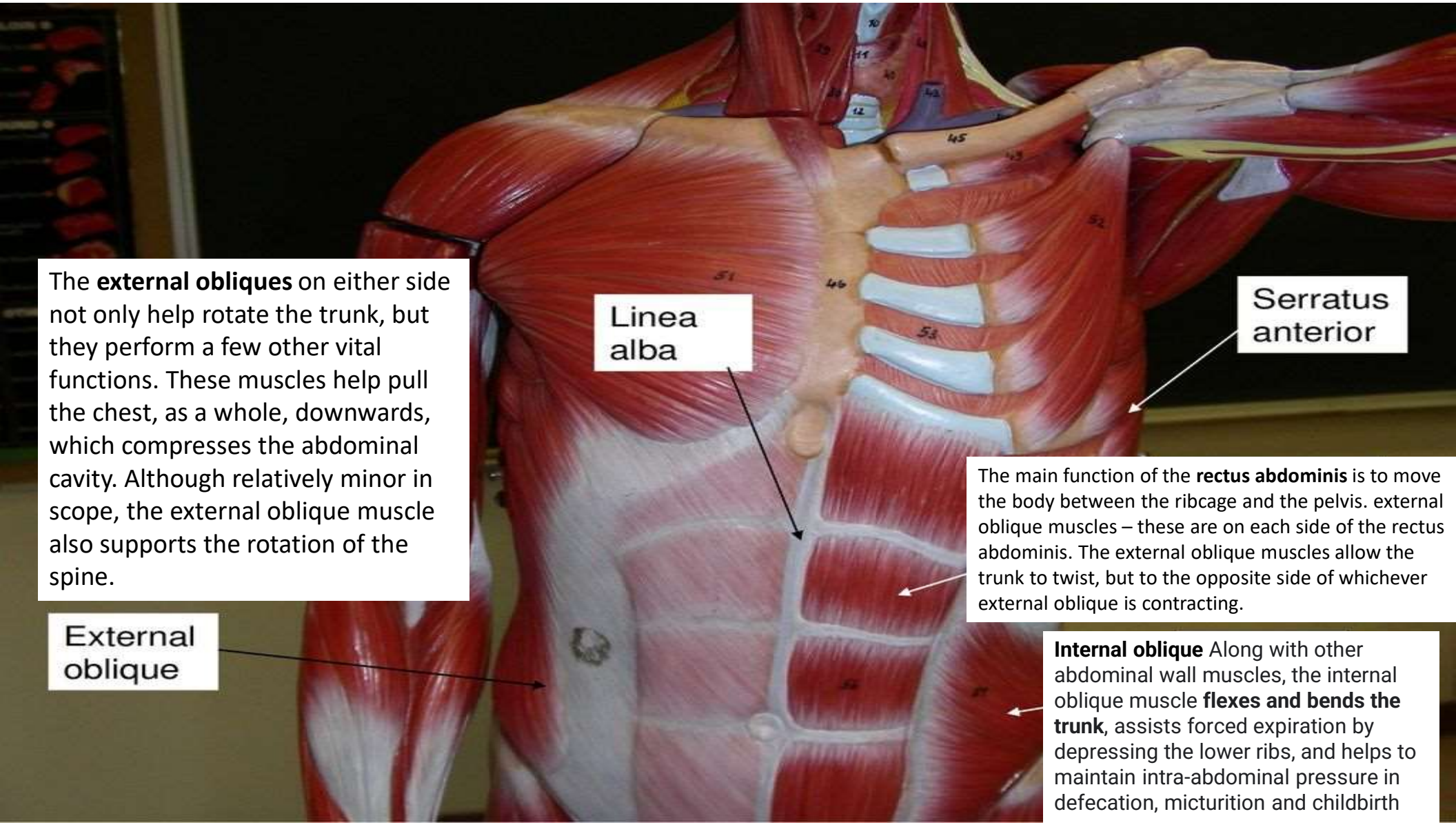
Name the muscles and give the function of each of them?



1. Frontalis : wrinkling the forehead
2. Orbiculiris oculi :closing the eye
3. Zygomaticus:smiling
4. Stenocleidiomastoid: turning the head
5. Orbicularis oris: compress the lips


Extensor carpi radialis longus
Abductor pollicis longus
Brachioradialis
Extensor carpi radialis brevis
Extensor pollicis brevis
Extensor digitorum
Extensor carpi ulnaris
Anconeus

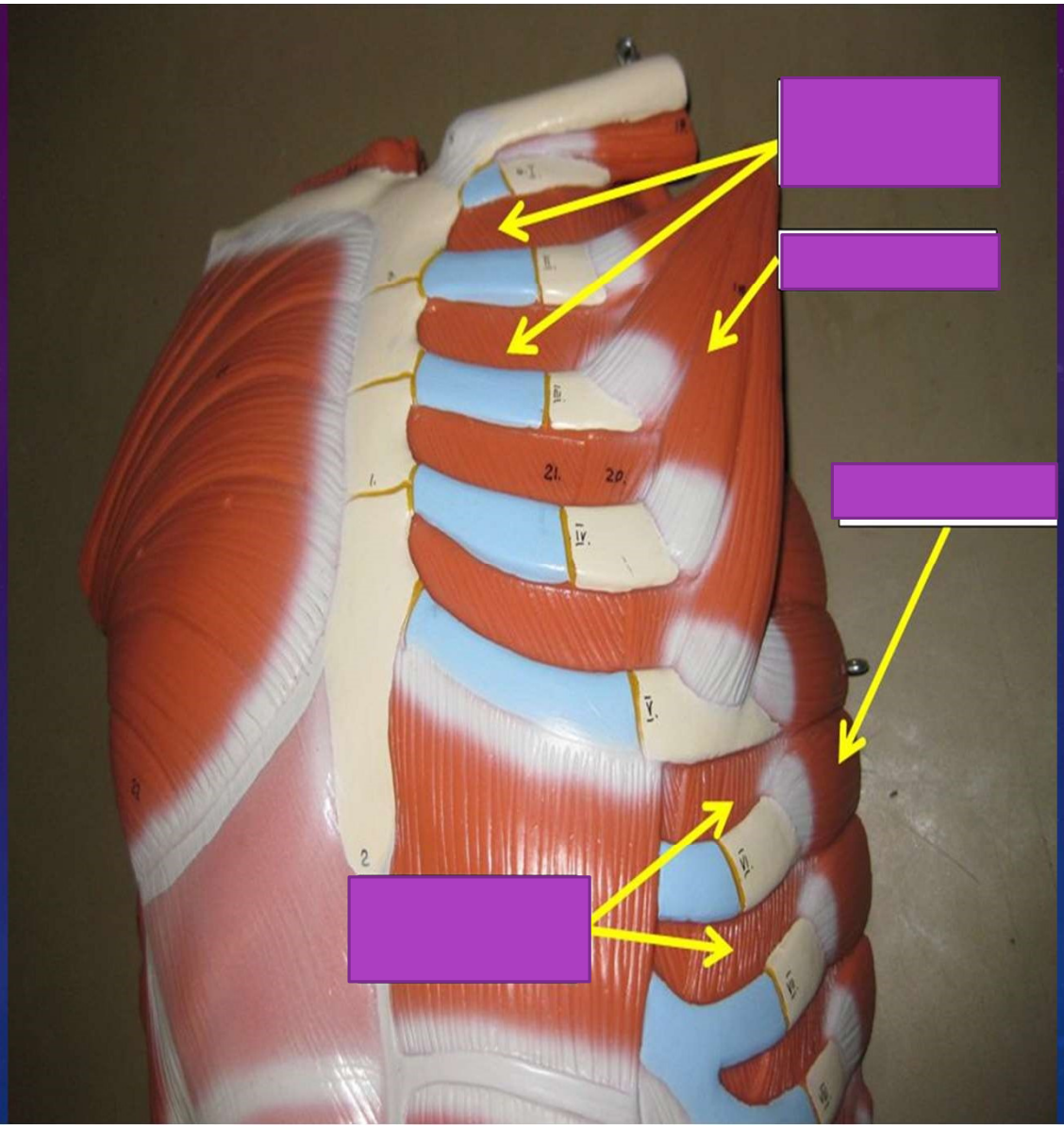


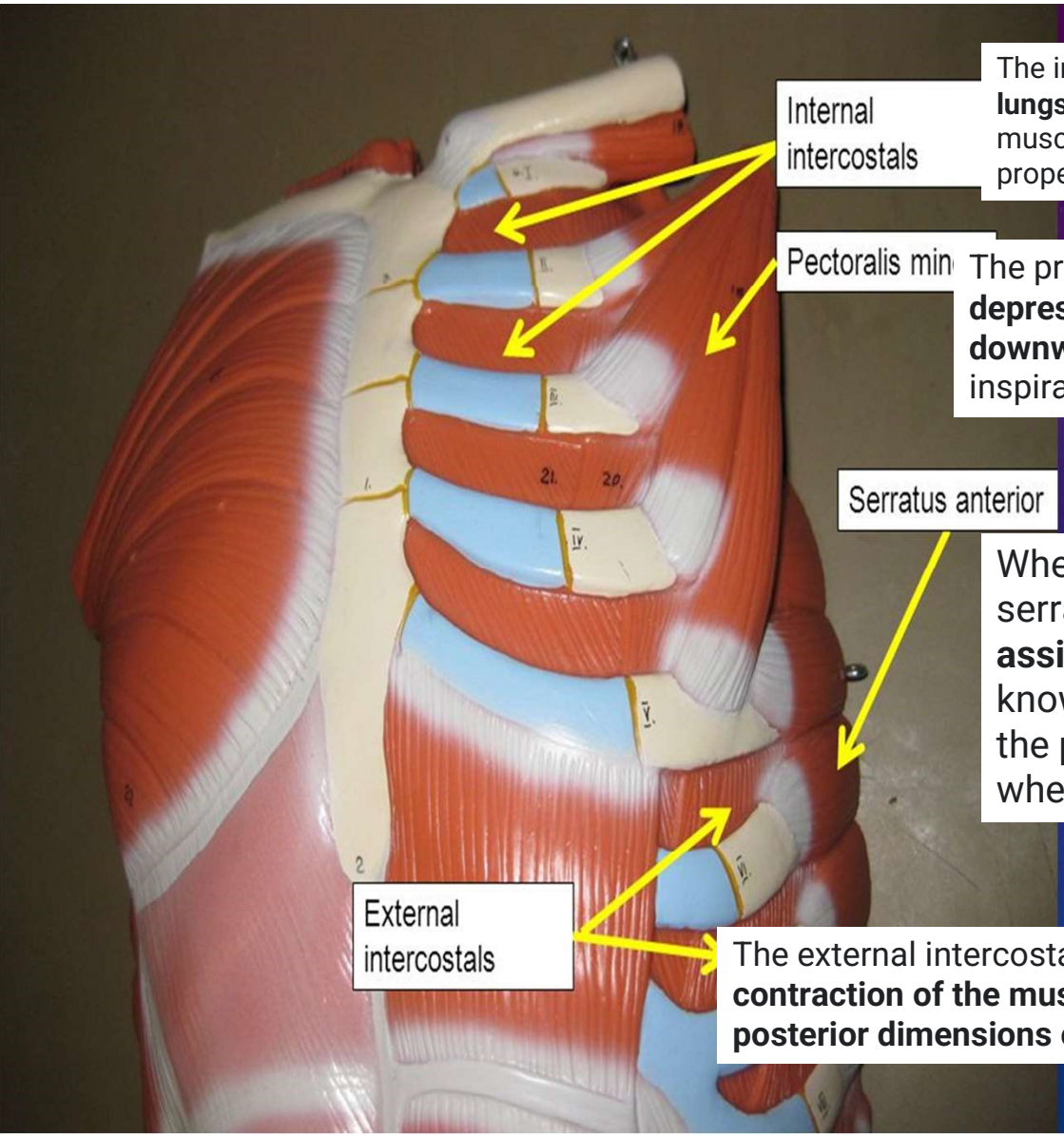


The **external obliques** on either side not only help rotate the trunk, but they perform a few other vital functions. These muscles help pull the chest, as a whole, downwards, which compresses the abdominal cavity. Although relatively minor in scope, the external oblique muscle also supports the rotation of the spine.

The main function of the **rectus abdominis** is to move the body between the ribcage and the pelvis. external oblique muscles – these are on each side of the rectus abdominis. The external oblique muscles allow the trunk to twist, but to the opposite side of whichever external oblique is contracting.

Internal oblique Along with other abdominal wall muscles, the internal oblique muscle **flexes and bends the trunk**, assists forced expiration by depressing the lower ribs, and helps to maintain intra-abdominal pressure in defecation, micturition and childbirth



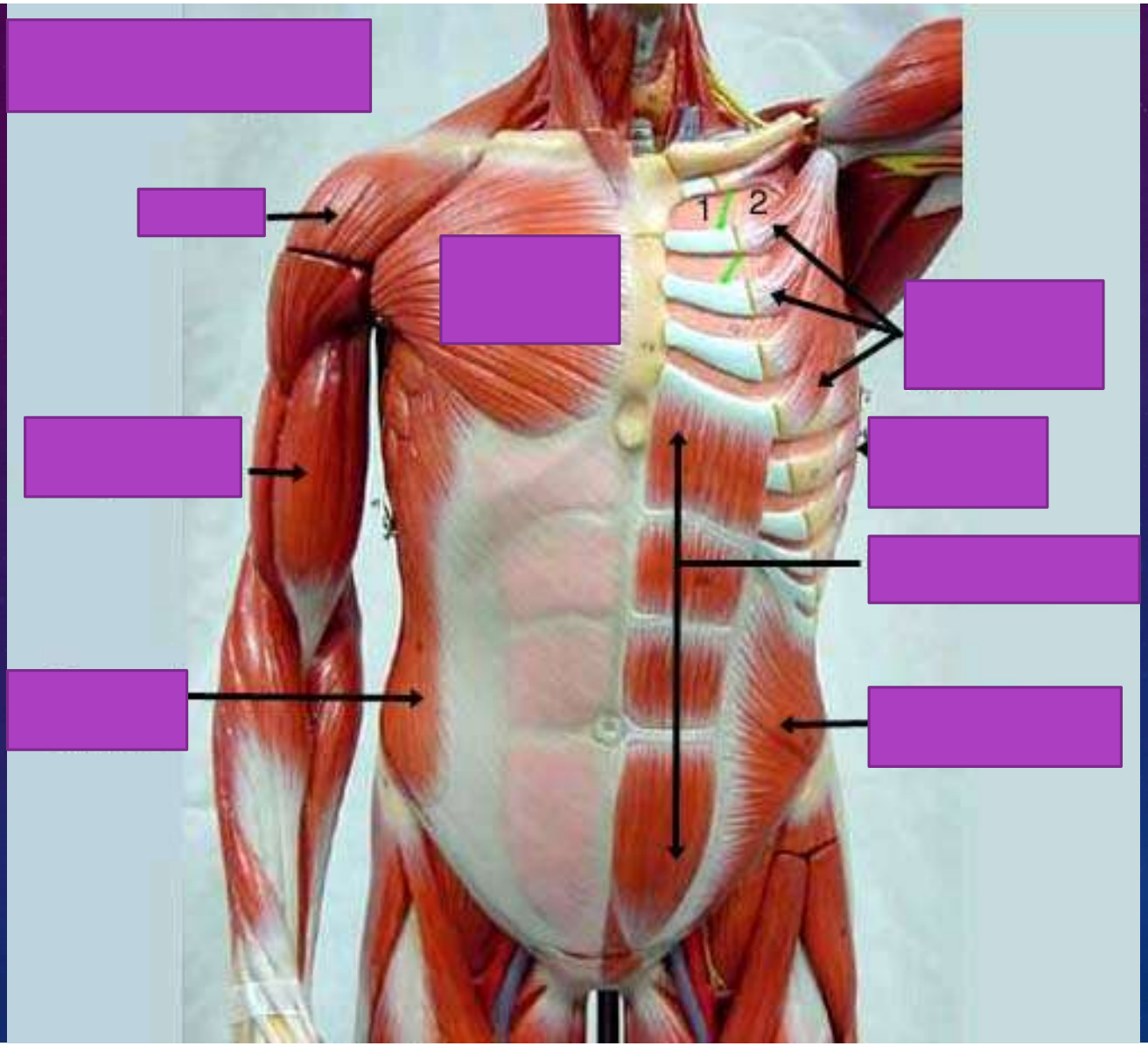


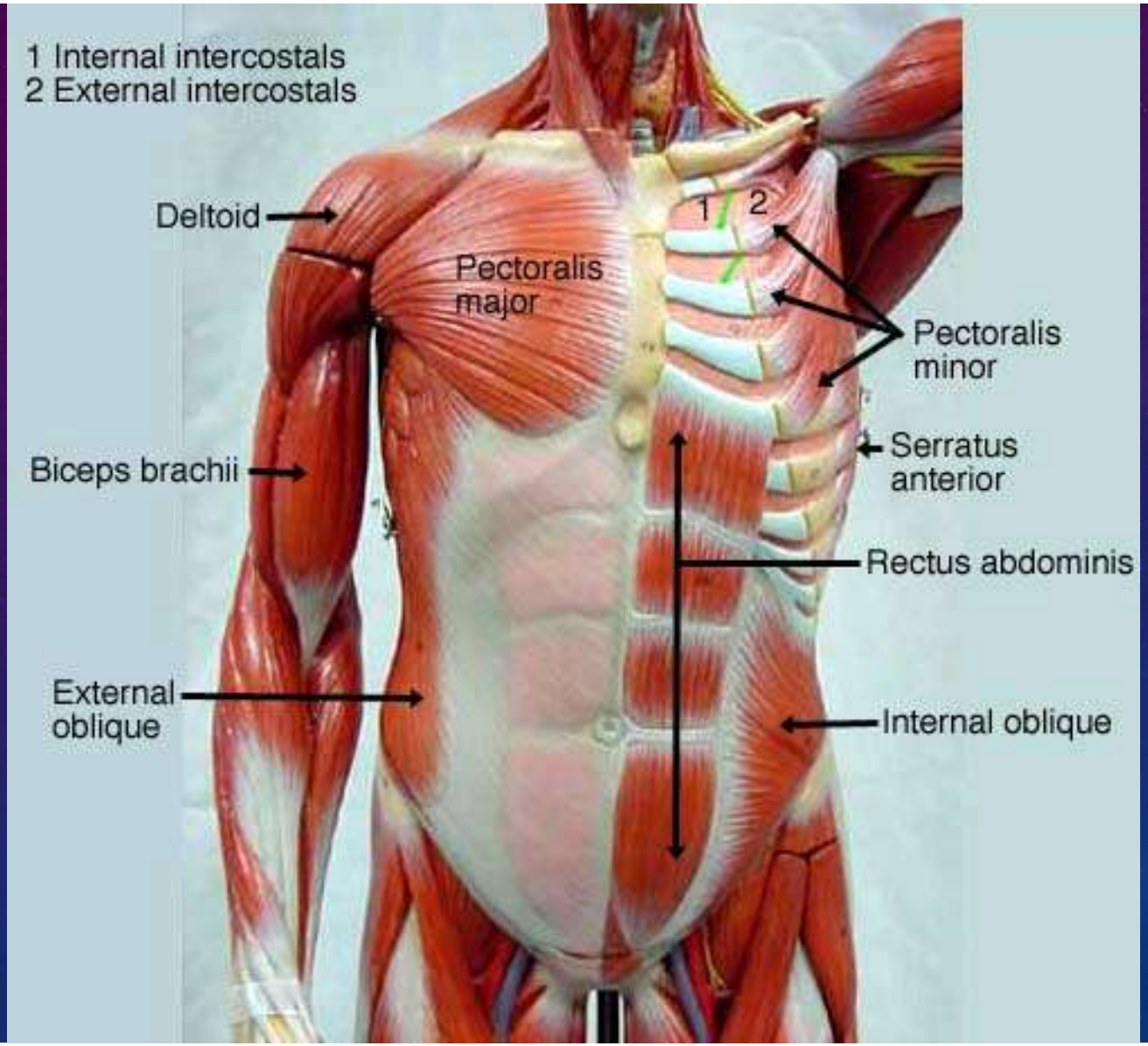
The internal intercostals **pull down on the rib cage and push air out of the lungs**. The internal intercostals are the most important respiratory muscles for normal speech and singing, for they are the muscles that propel air out through the mouth and nose.

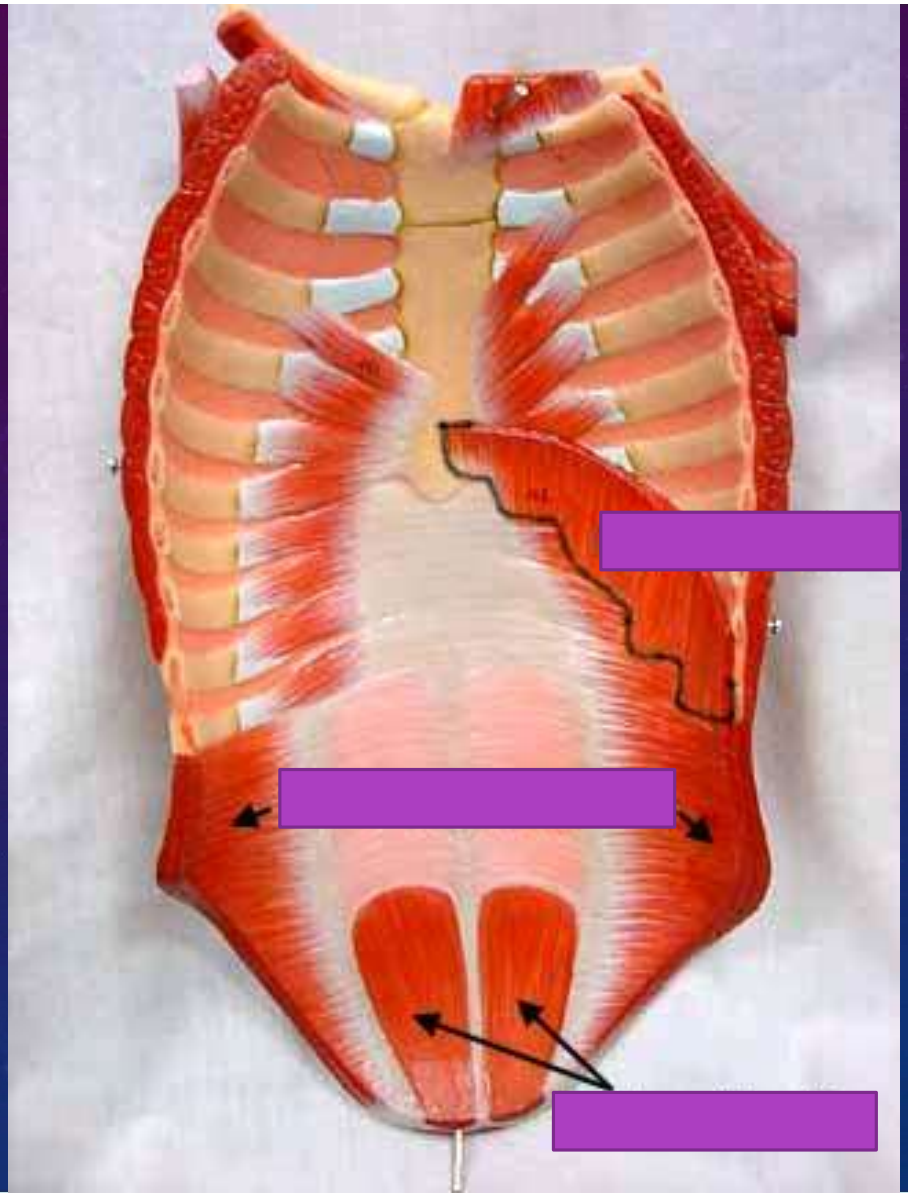
The primary actions of this muscle include the **stabilization, depression, abduction or protraction, internal rotation and downward rotation of the scapula**. It elevates the ribs for deep inspiration when the pectoral girdle is fixed or elevated.

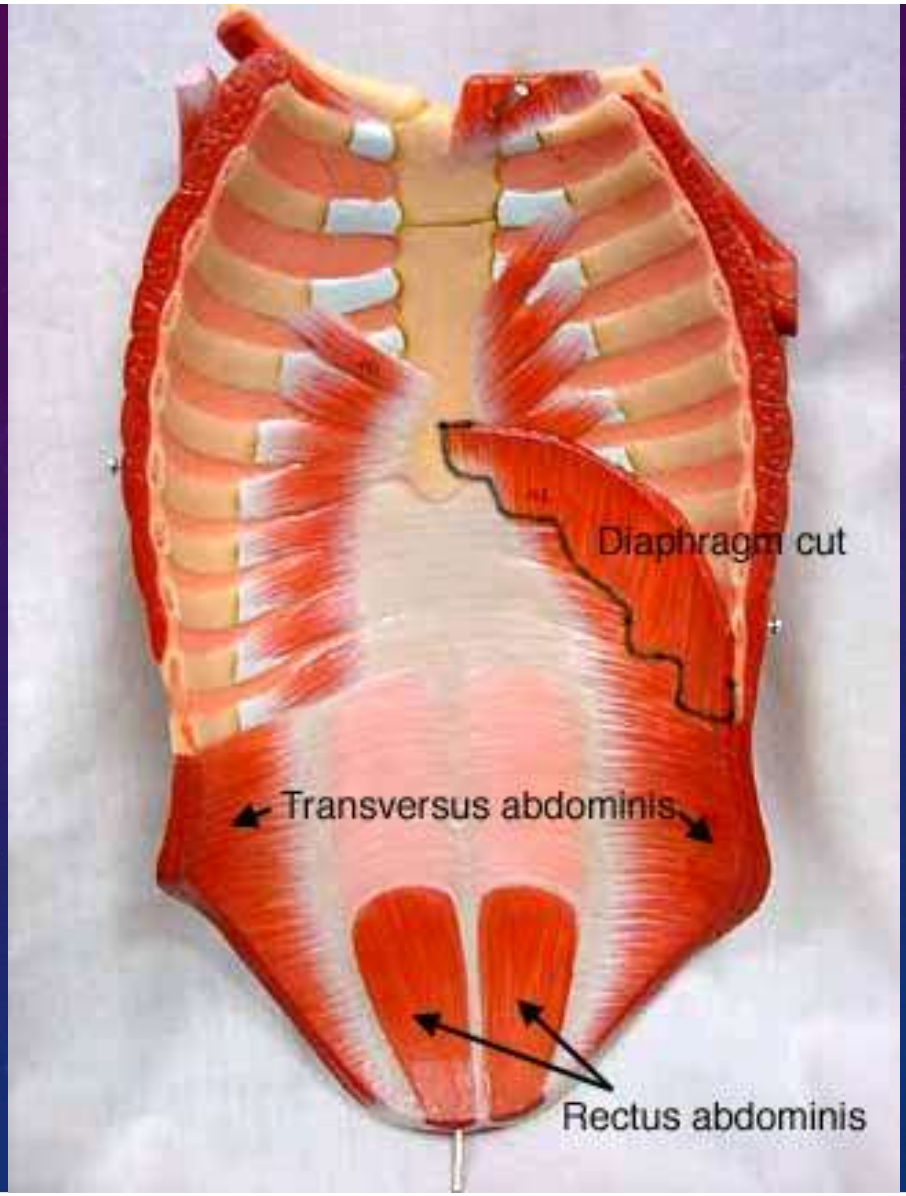
When the shoulder girdle is fixed, all three parts of the serratus anterior muscle work **together to lift the ribs, assisting with respiration**. The serratus anterior, also known as the “boxer's muscle,” is largely responsible for the protraction of the scapula, a movement that occurs when throwing a punch

The external intercostal muscles connect the ribs in such a way that **the contraction of the muscles lifts the ribs and rib cage and expands the anterior–posterior dimensions of the rib cage**.

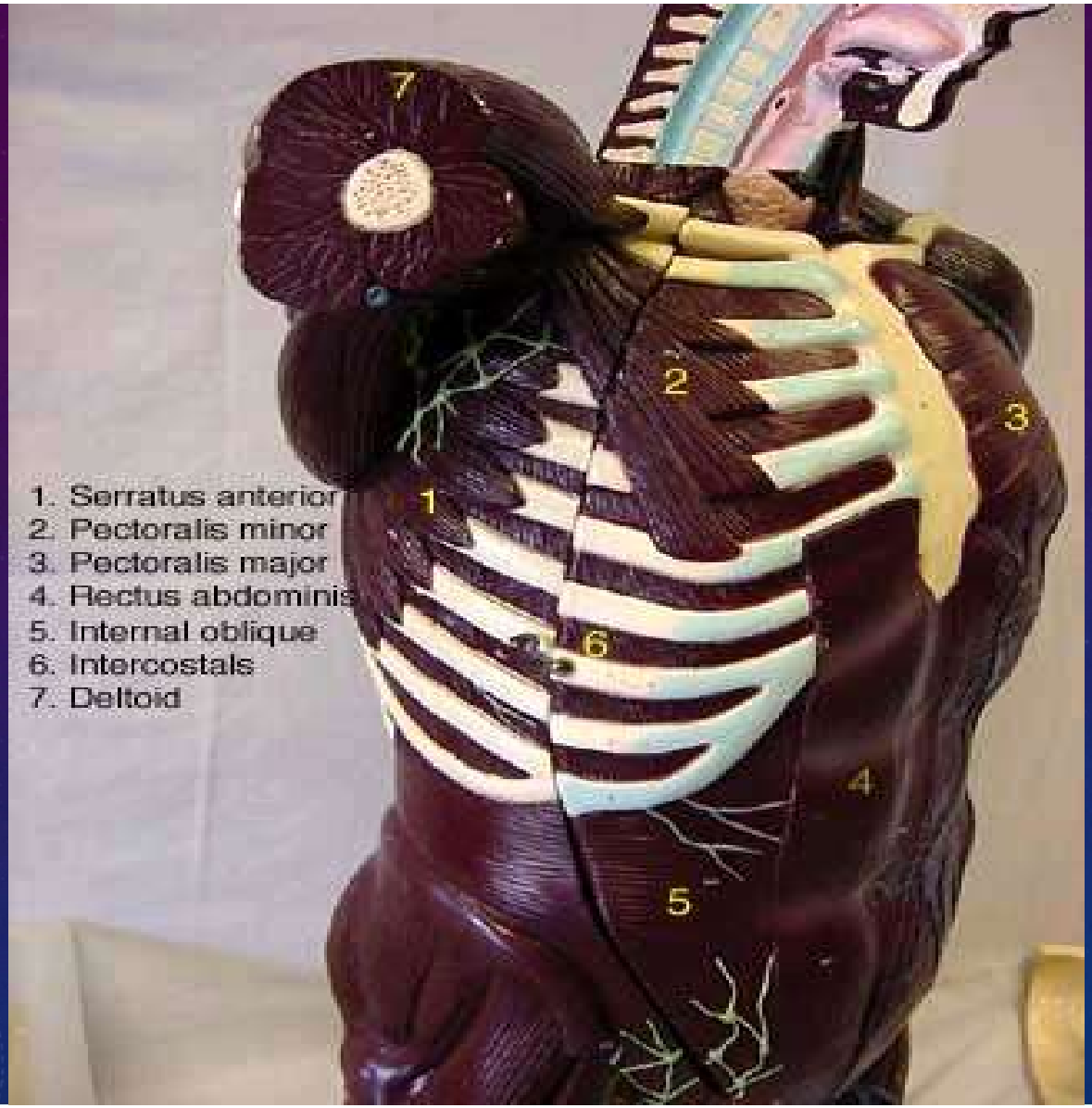

1
2

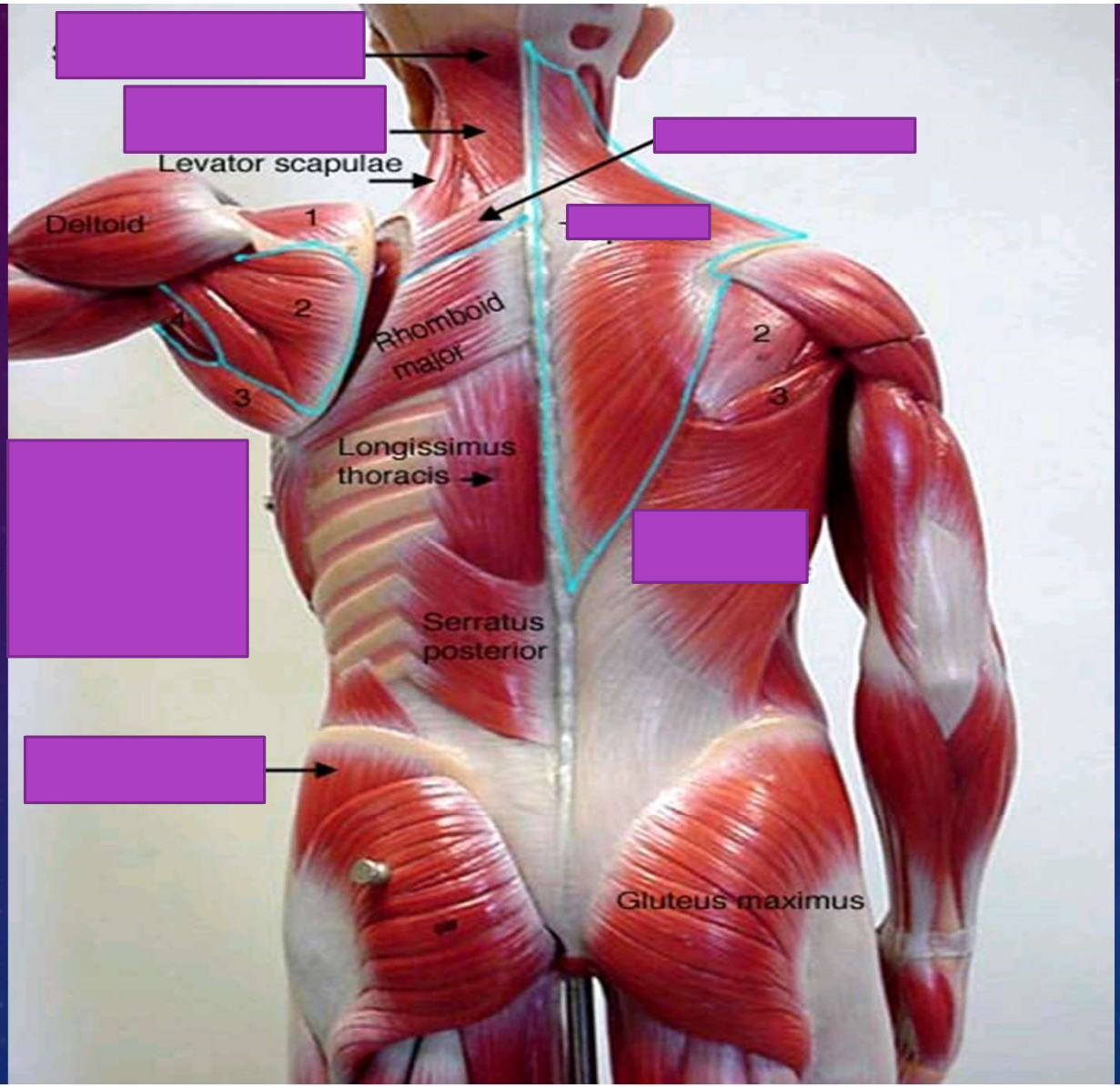

1 Internal intercostals
2 External intercostals
Deltoid
Pectoralis major
1
2
Pectoralis minor
Serratus anterior
Biceps brachii
Rectus abdominis
External oblique
Internal oblique

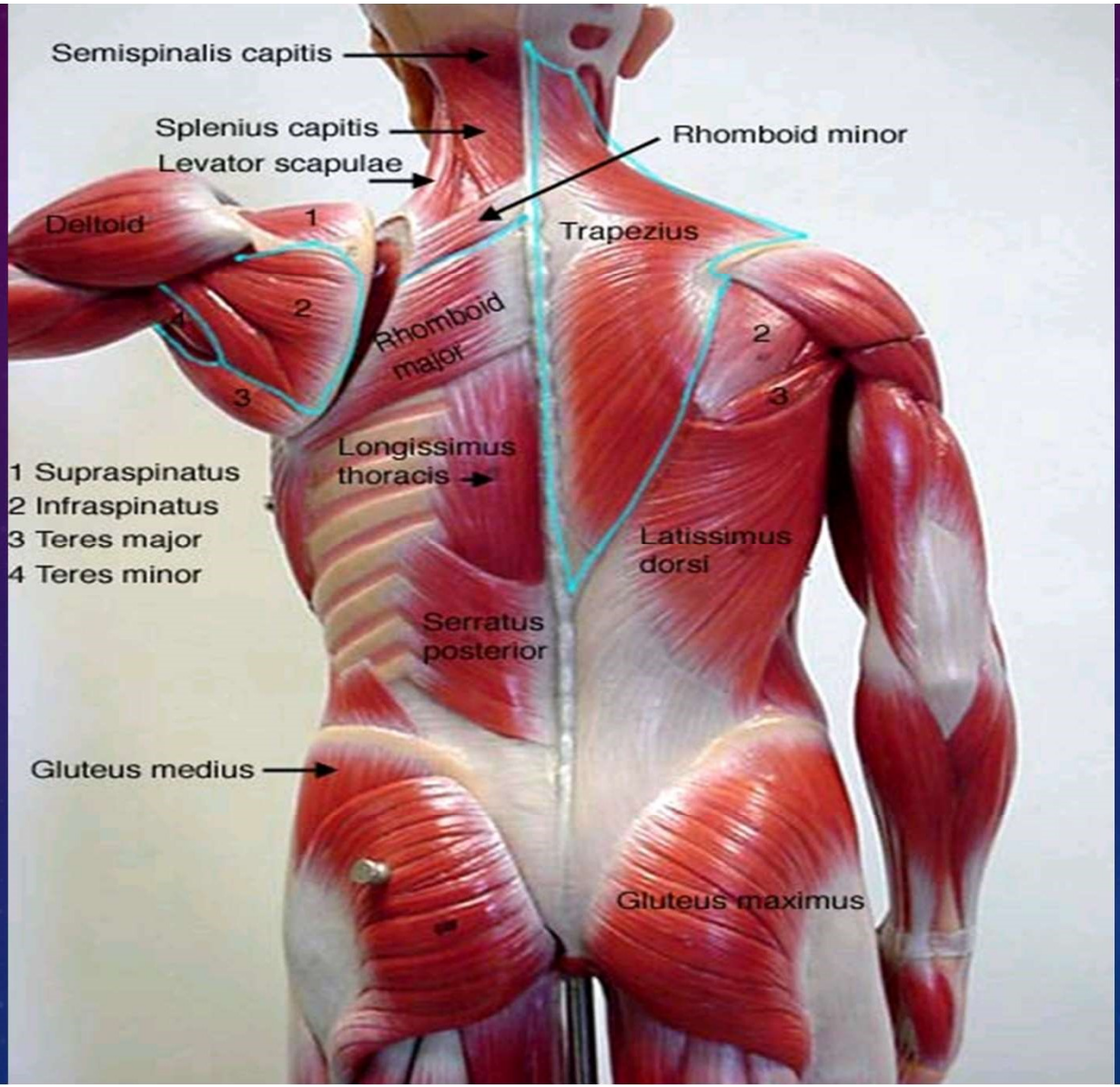


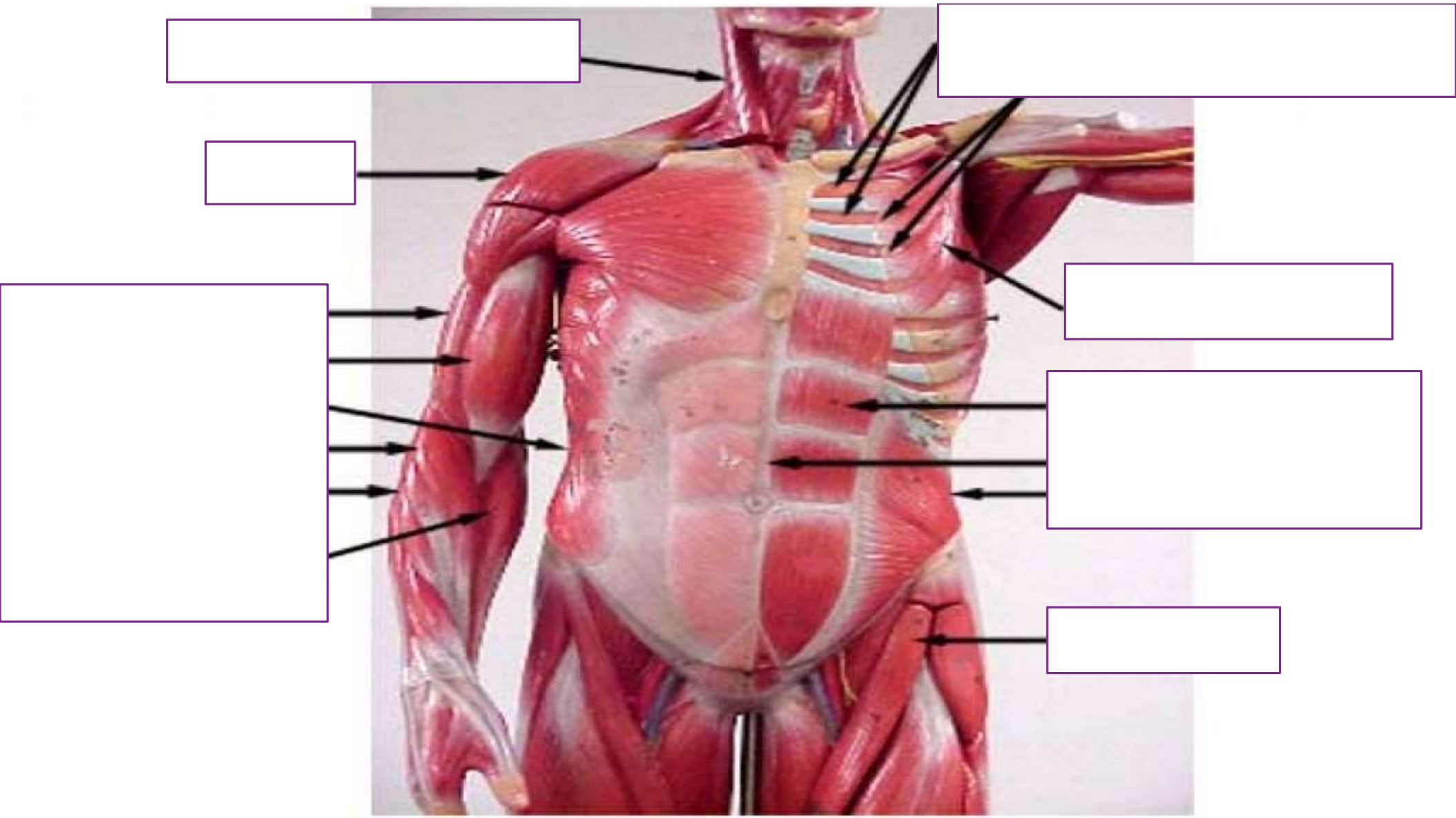

Diaphragm cut
Transversus abdominis
Rectus abdominis

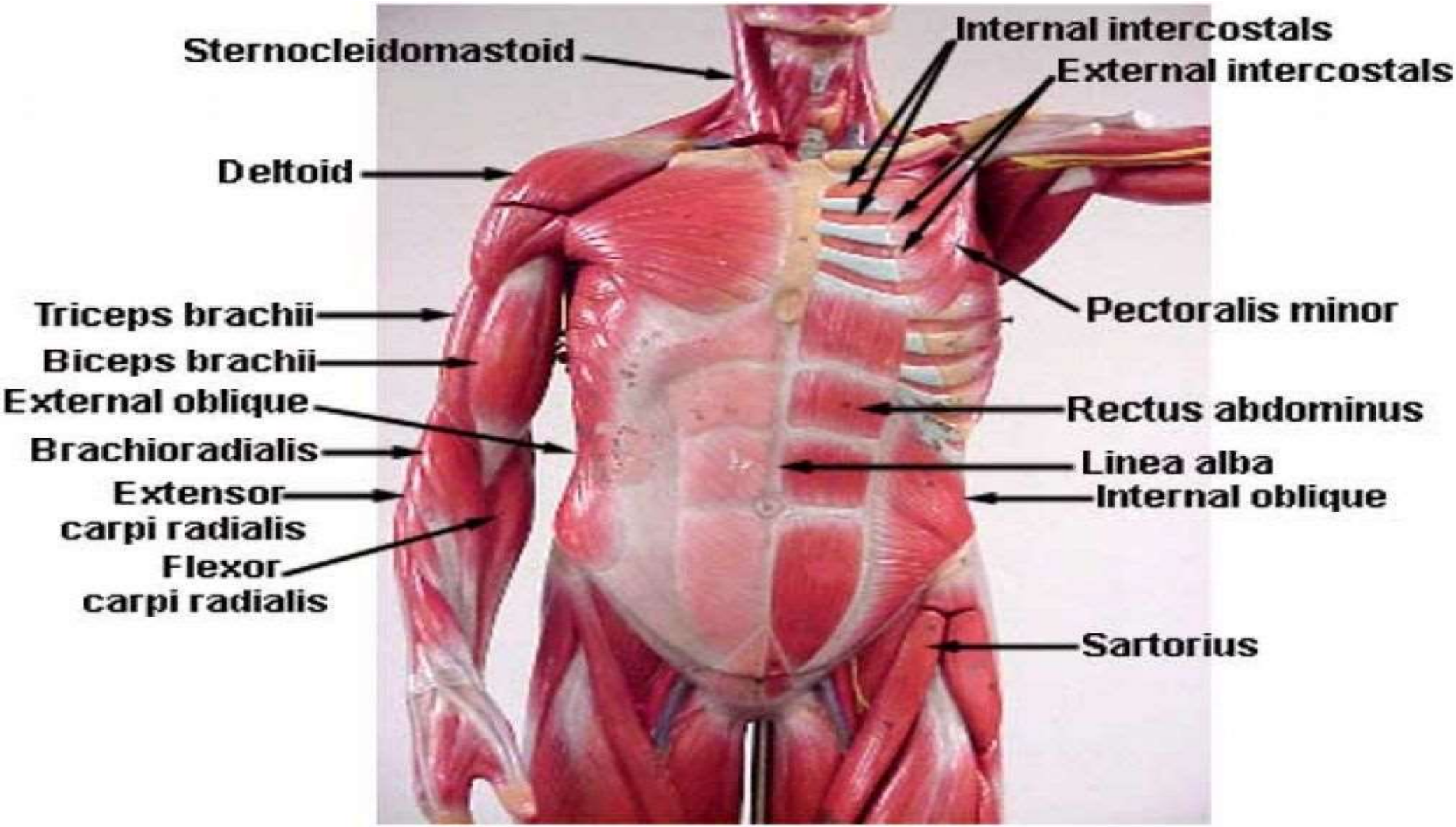

7
2
3
1
6
4
5


1. Serratus anterior
2. Pectoralis minor
3. Pectoralis major
4. Rectus abdominis
5. Internal oblique
6. Intercostals
7. Deltoid
1
2
3
4
5
6
7


Levator scapulae
Deltoid
1
2
3
4
Rhomboid major
2
3
Longissimus thoracis
Serratus posterior
Gluteus maximus

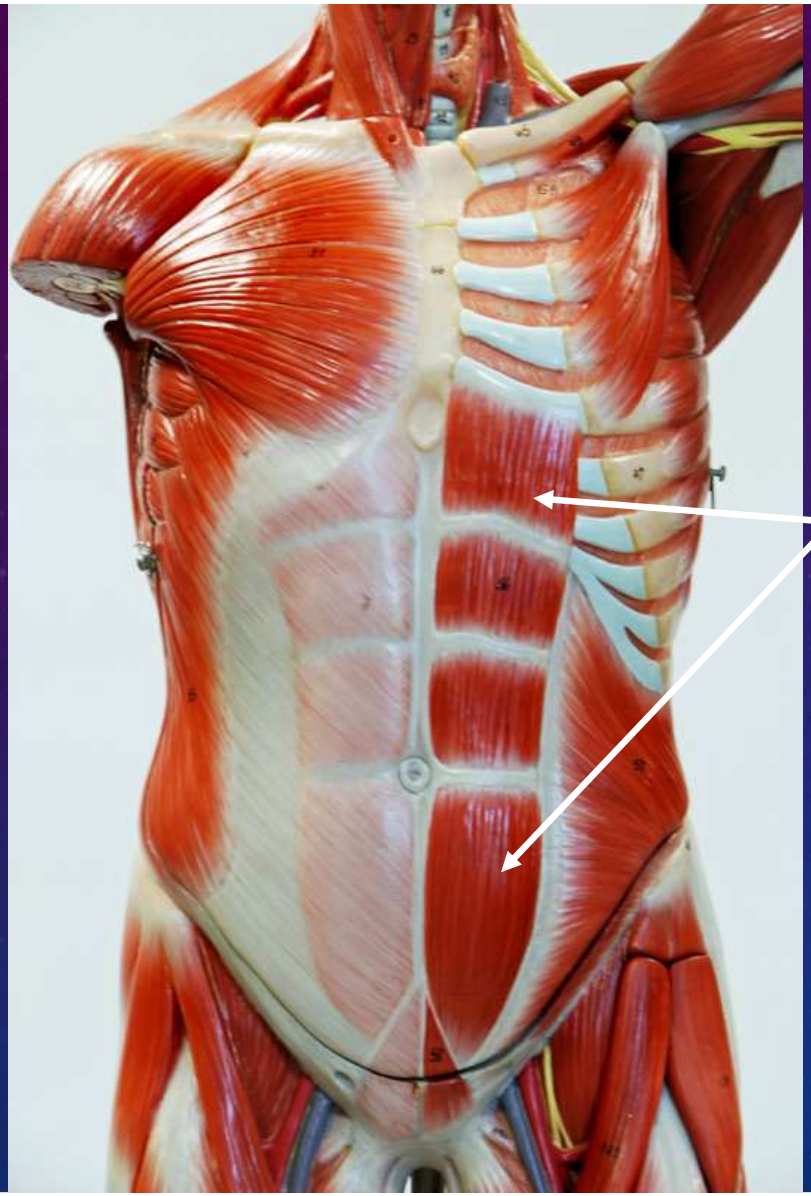

Semispinalis capitis
Splenius capitis
Levator scapulae
Rhomboid minor
Deltoid
1
Trapezius
2
4
Rhomboid major
2
3
3
Longissimus thoracis
1 Supraspinatus
2 Infraspinatus
3 Teres major
4 Teres minor
Latissimus dorsi
Serratus posterior
Gluteus medius
Gluteus maximus

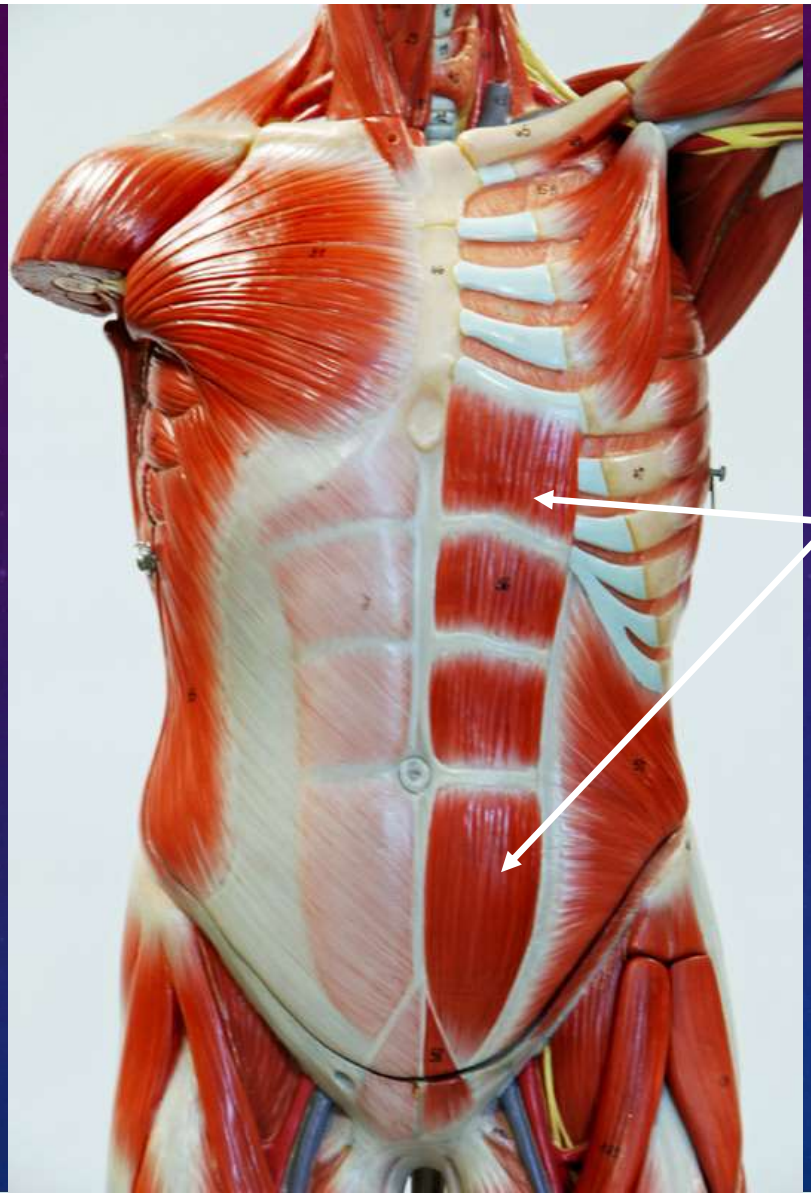



Sternocleidomastoid
Deltoid
Triceps brachii
Biceps brachii
External oblique
Brachioradialis
Extensor carpi radialis
Flexor carpi radialis
Internal intercostals
External intercostals
Pectoralis minor
Rectus abdominus
Linea alba
Internal oblique
Sartorius

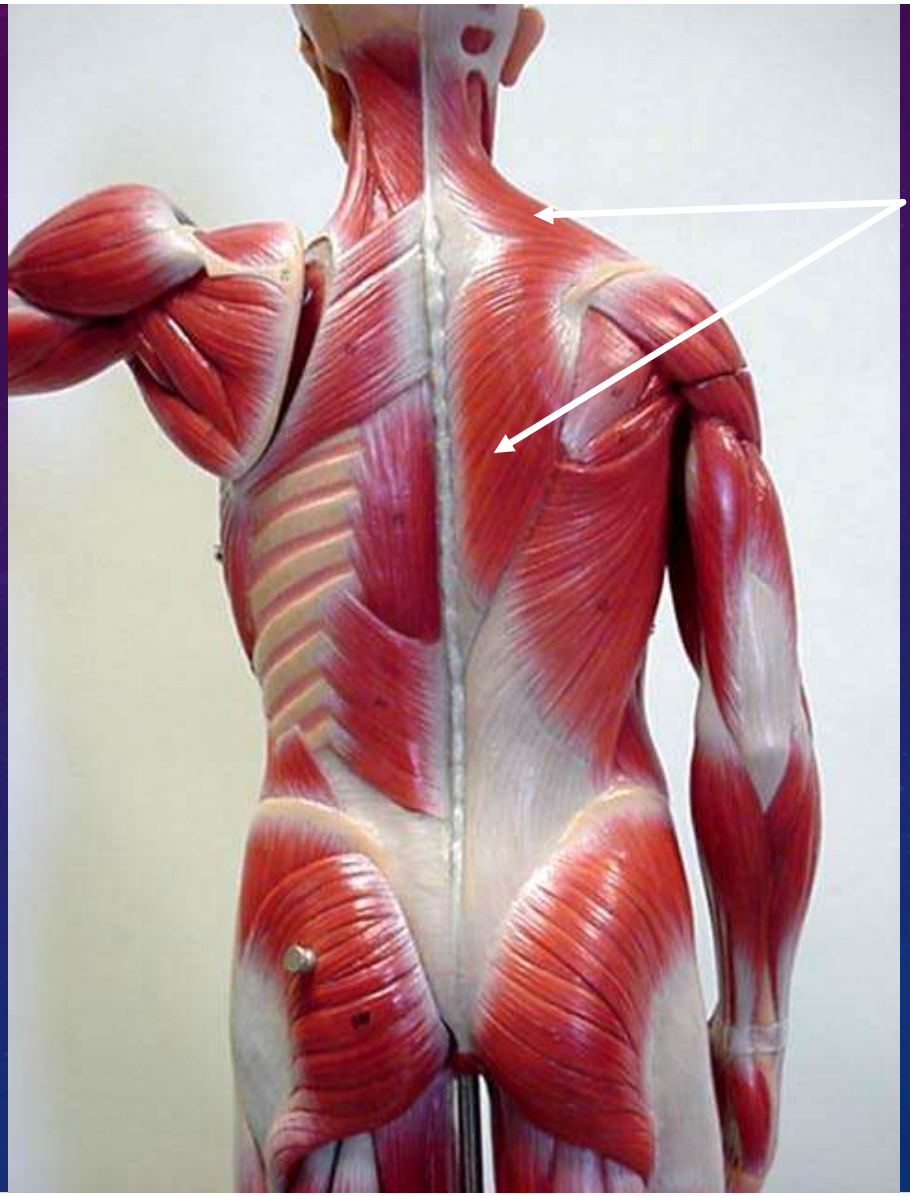
Internal intercostals

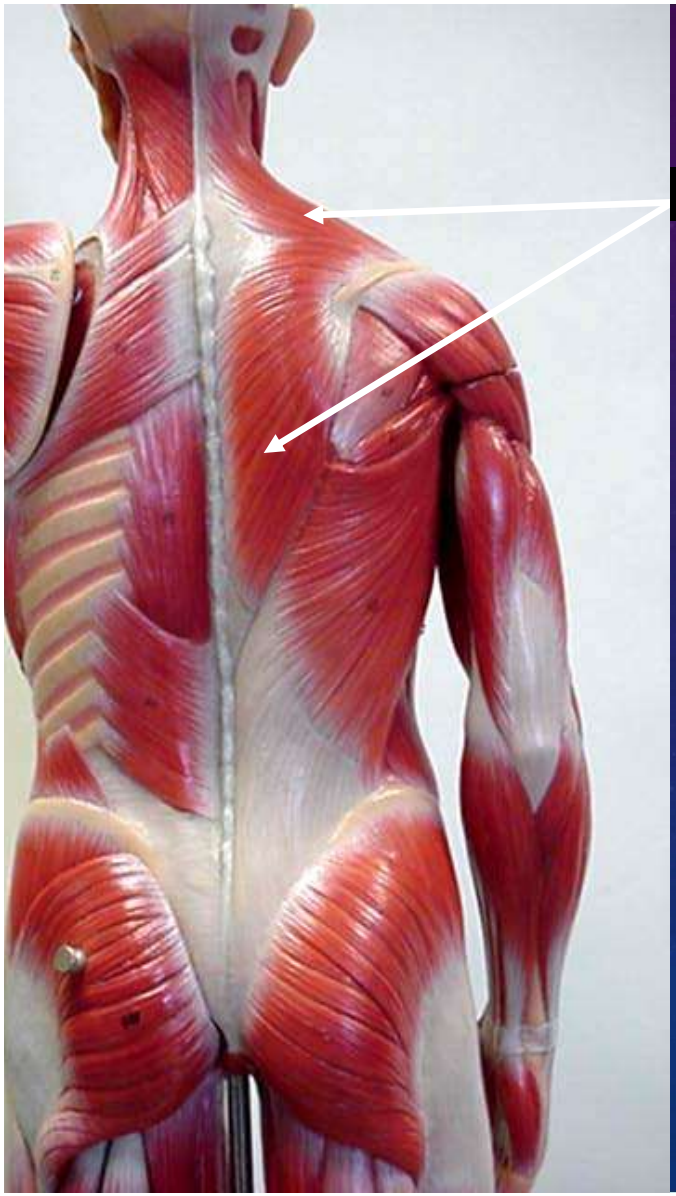
Action: Pulls ribs inferiorly to cause expiration (exhalation)





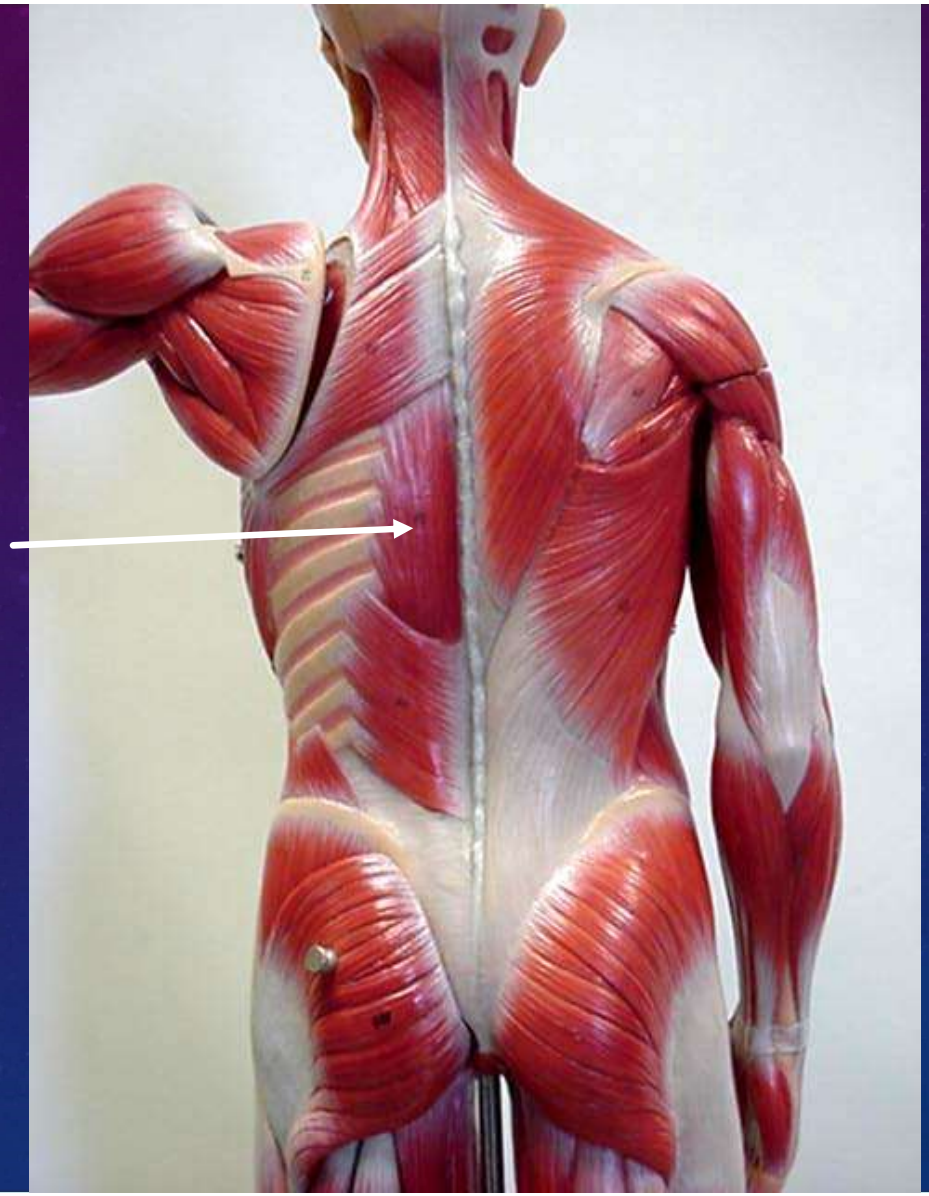
Action: Flexion of torso at vertebral column





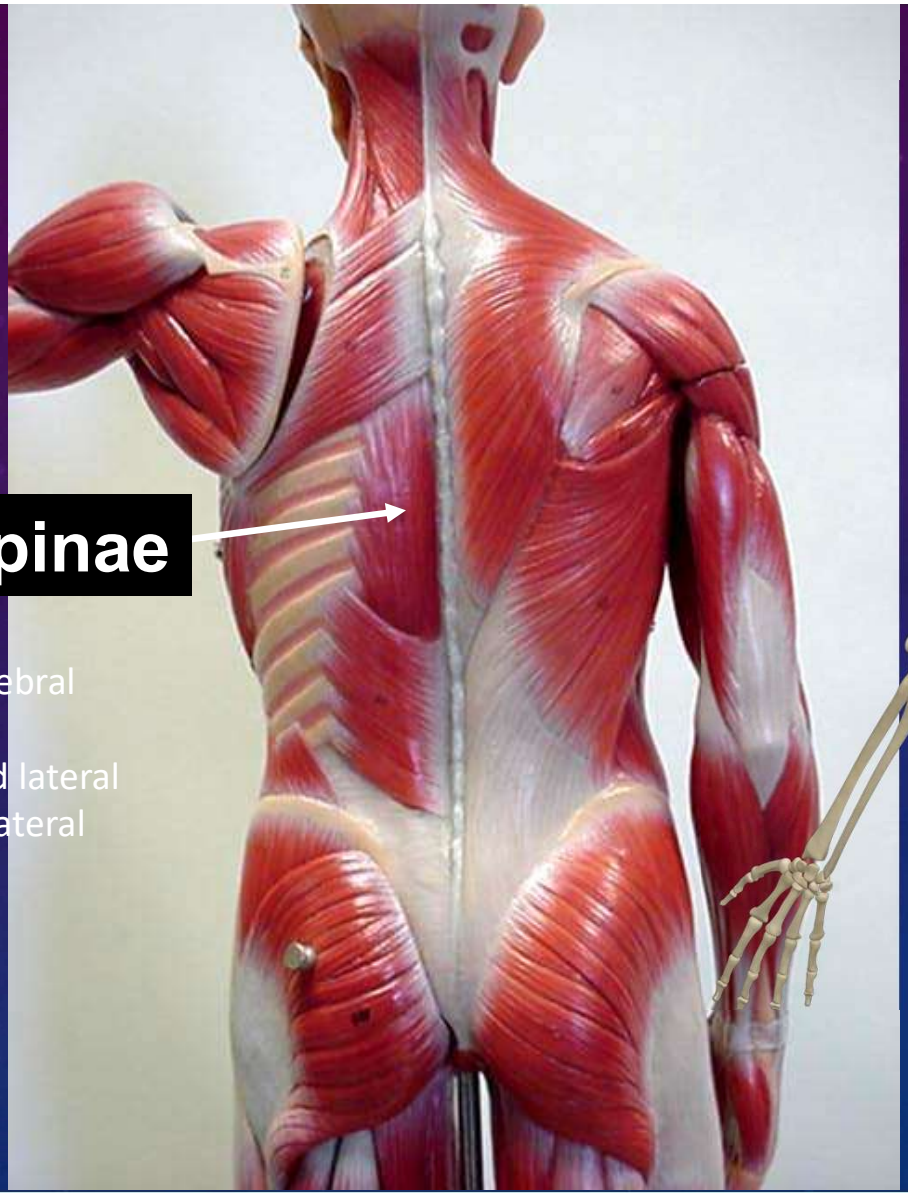
Trapezius

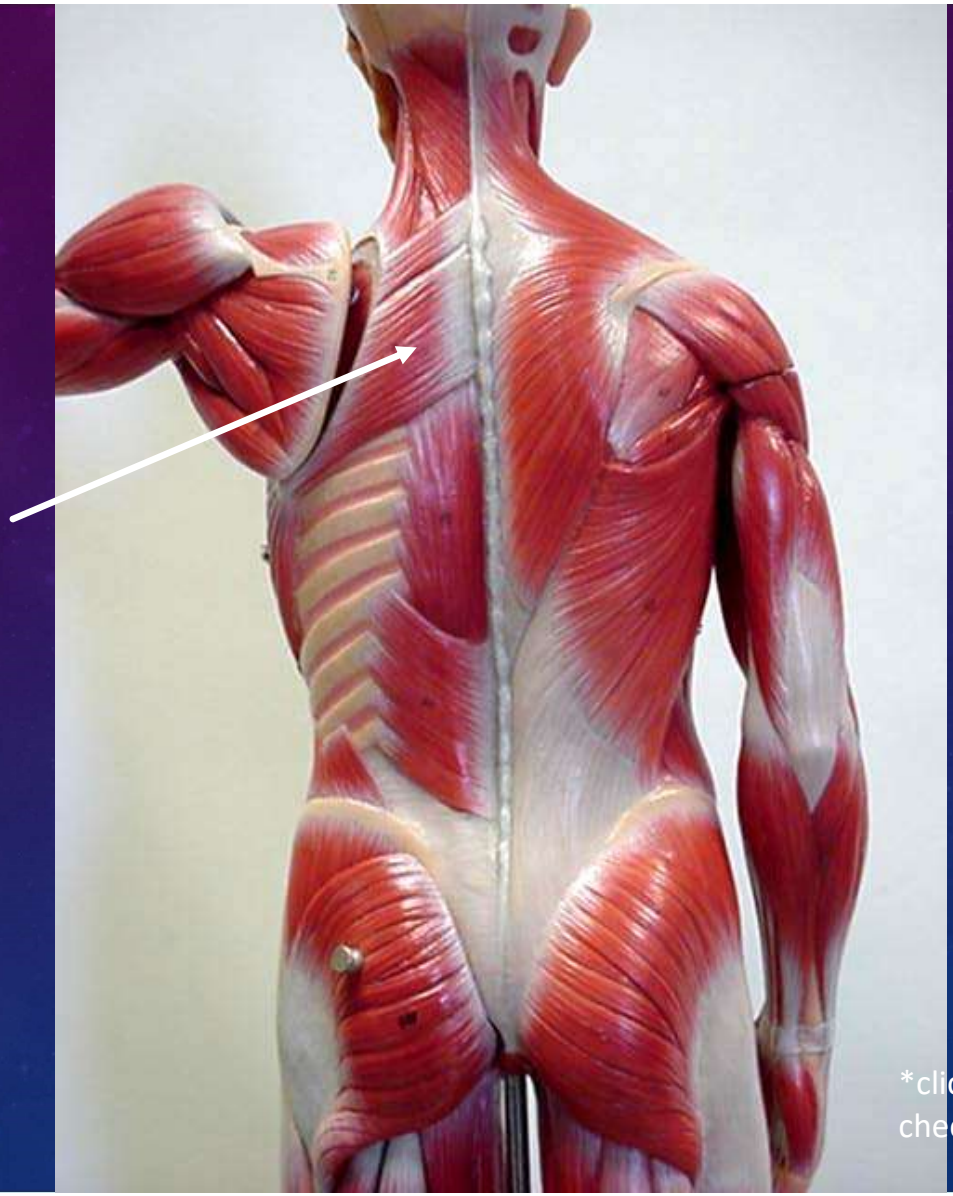
Action: Elevation, retraction or depression of the scapula; Extension of the head and neck



Erector spinae

Action: Extension of vertebral column with bilateral contraction; Rotation and lateral flexion of spine with unilateral contraction





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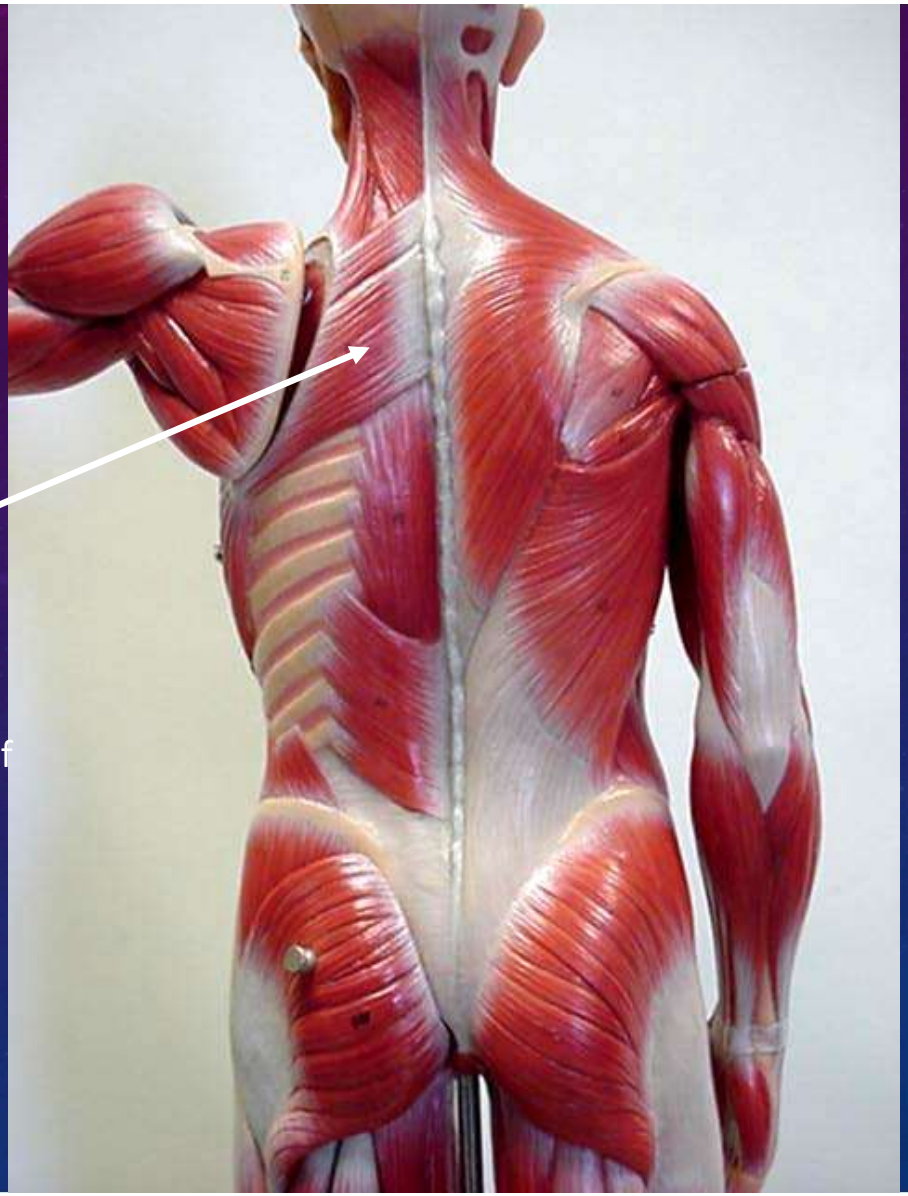
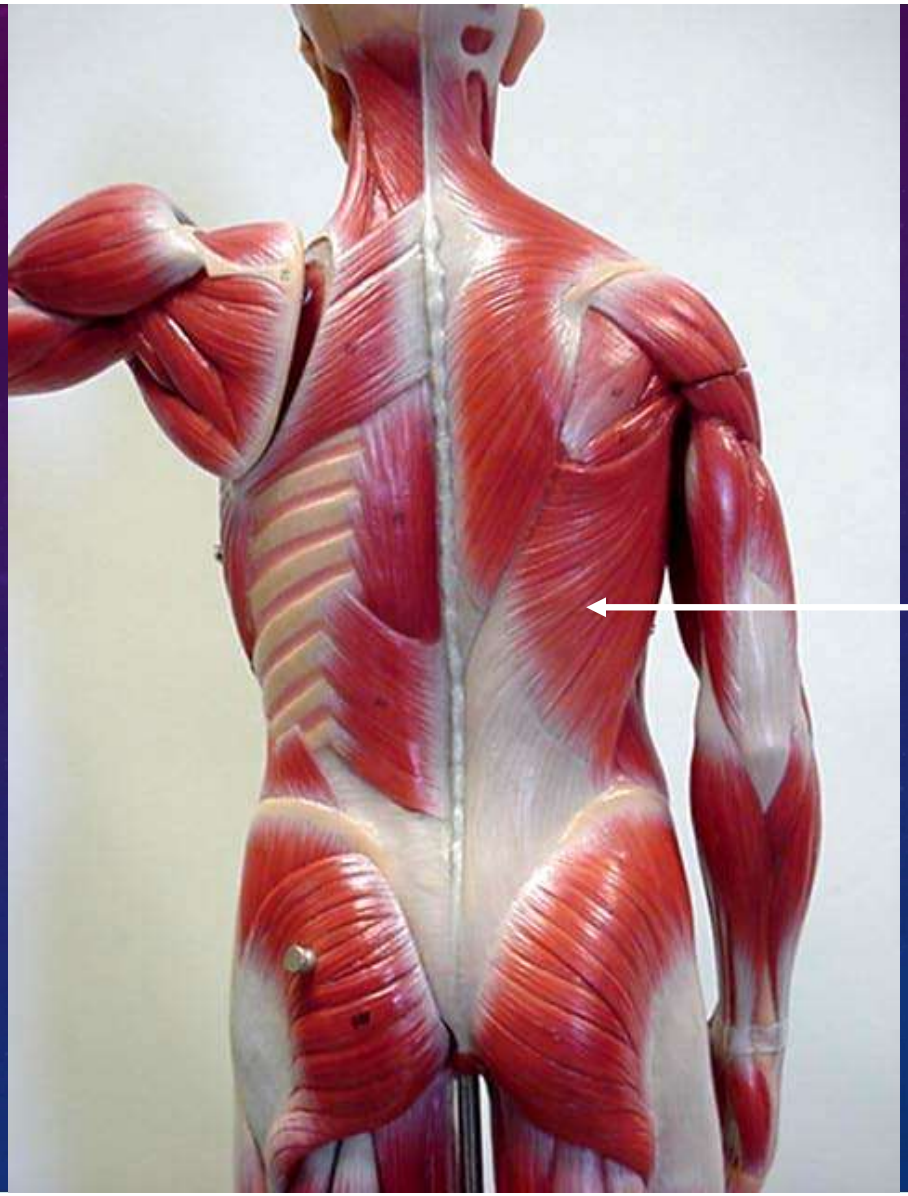


Action: Retraction of the scapula

*click to the next slide to check your answer

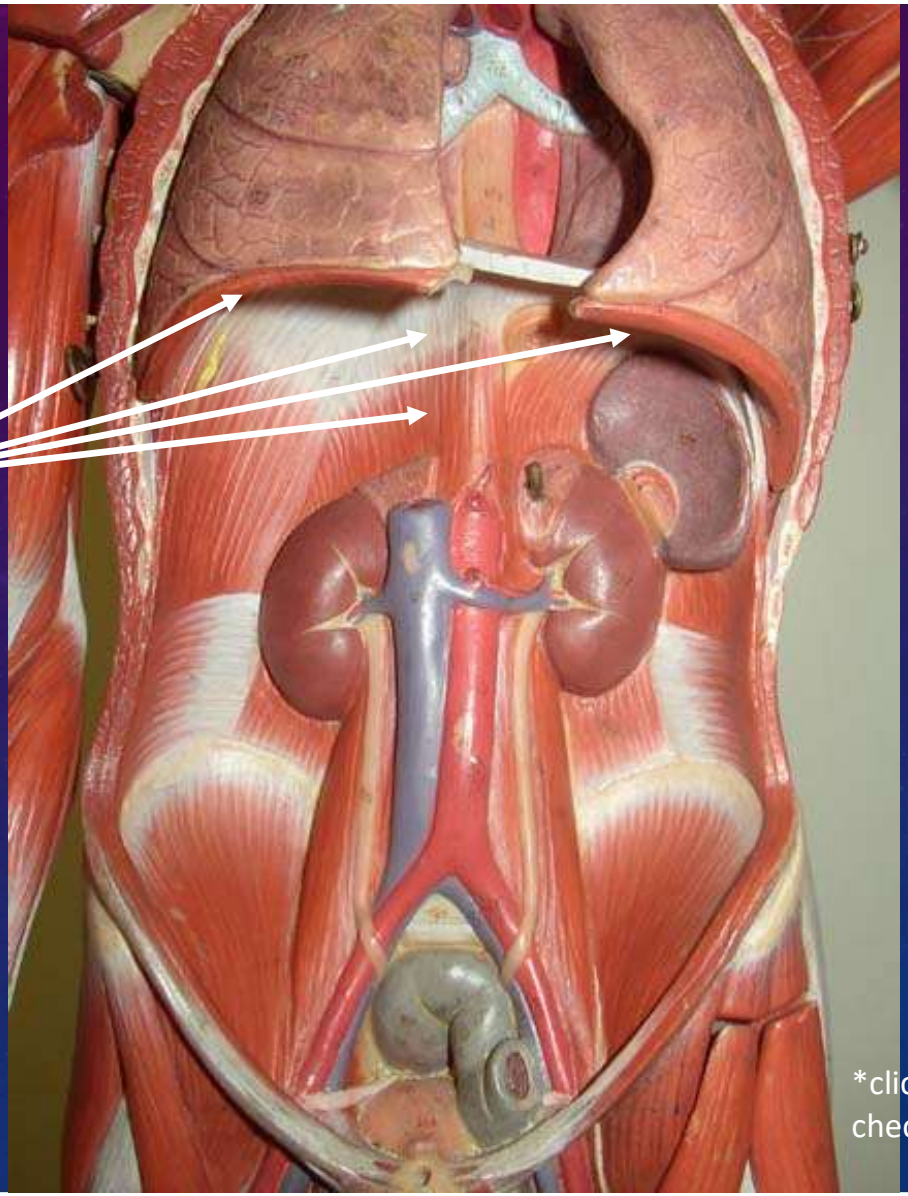


Action:
Extension, adduction and medial rotation of the arm at the shoulder

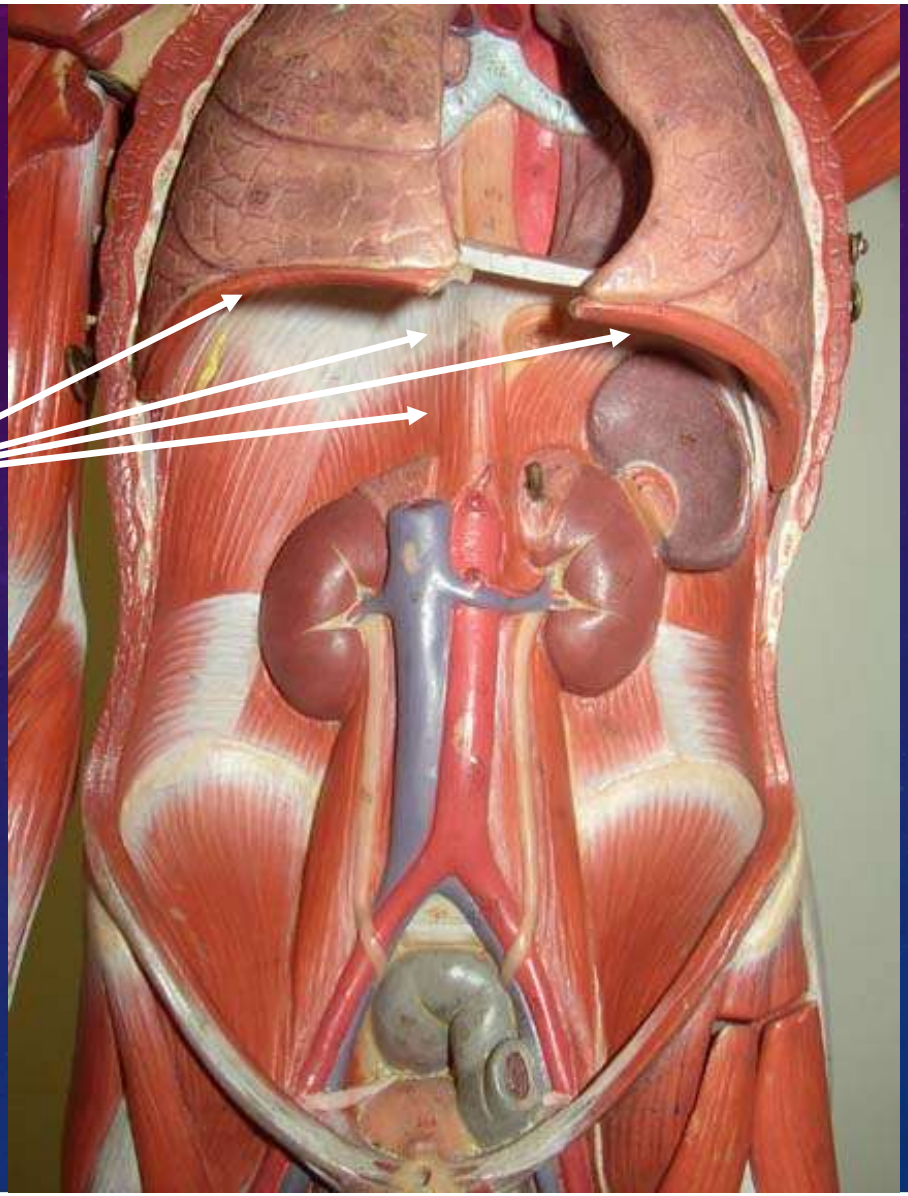
*click to the next slide to check your answer

Sternocleidomastoid

Action: Flexion of the head and neck with bilateral (both left and right) contraction; Lateral flexion and rotation of the head and neck with unilateral contraction



*click to the next slide to check your answer



Action: Contraction causes inspiration (inhalation) by increasing the volume of the thoracic cavity

*click to the next slide to check your answer

Action: Elevation of the scapula

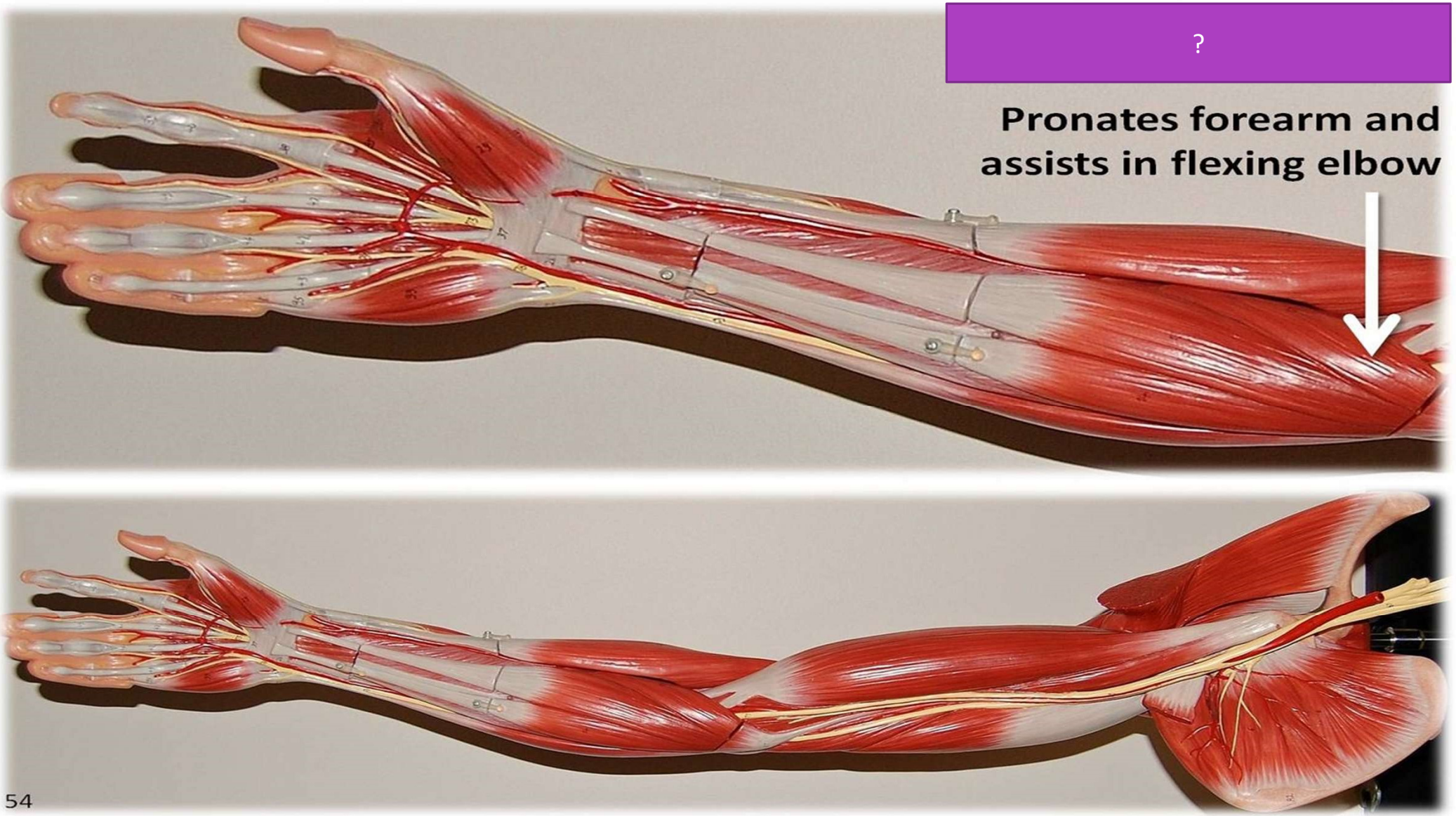
*click to the next slide to check your answer

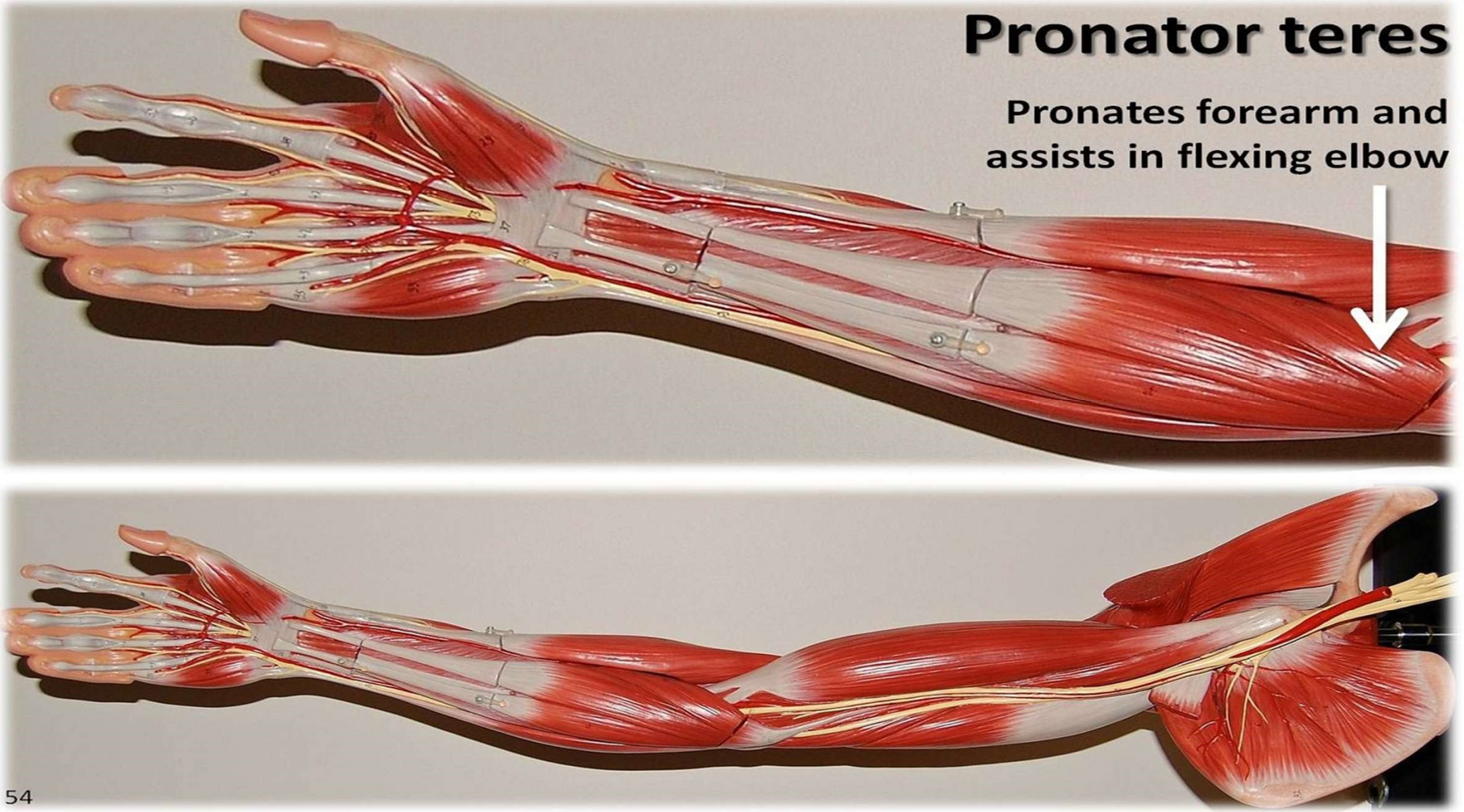
Action: Flexion at the elbow and supination of the forearm

*click to the next slide to check your answer

Action: Internal (medial) rotation of the arm at the shoulder

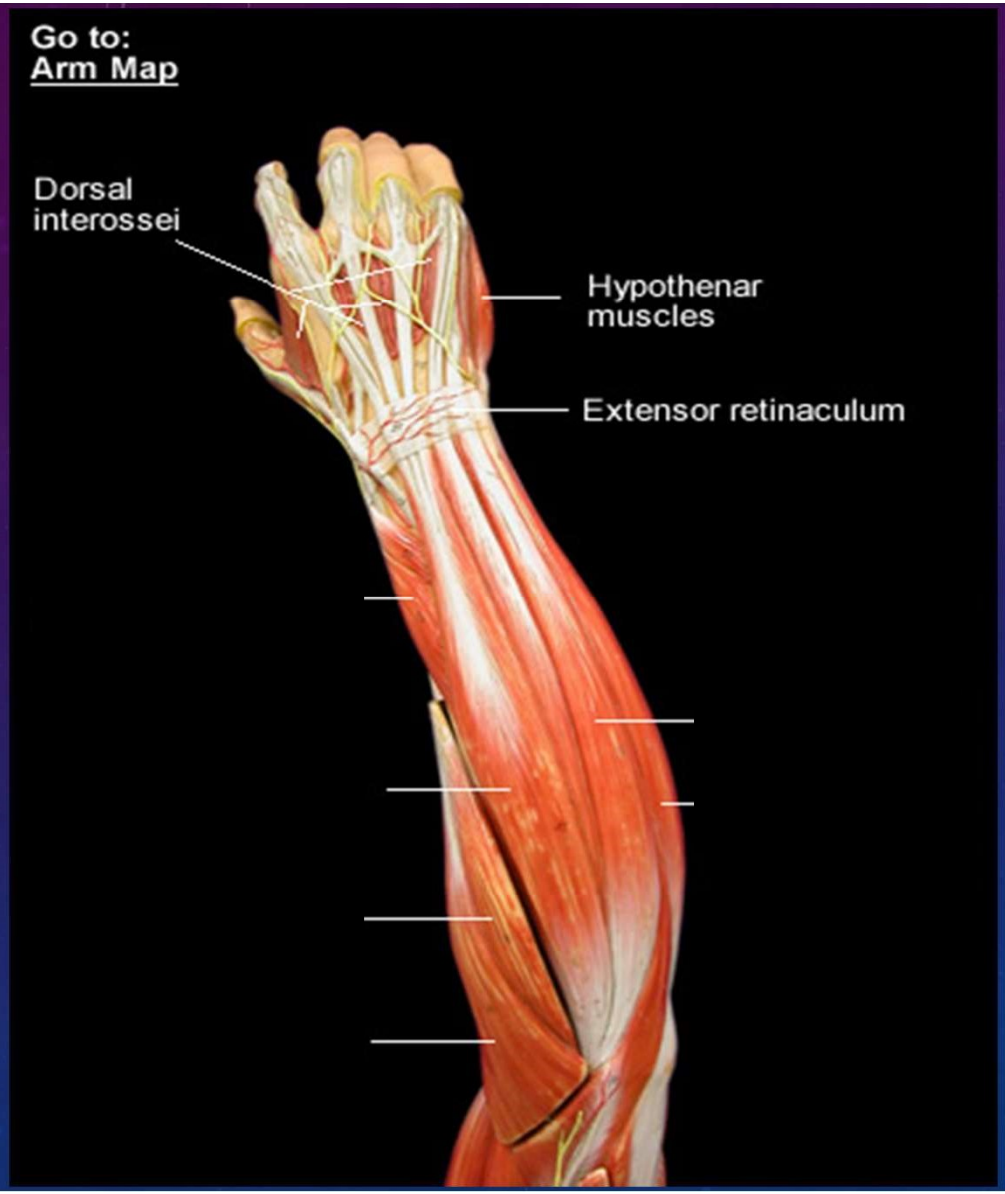
?

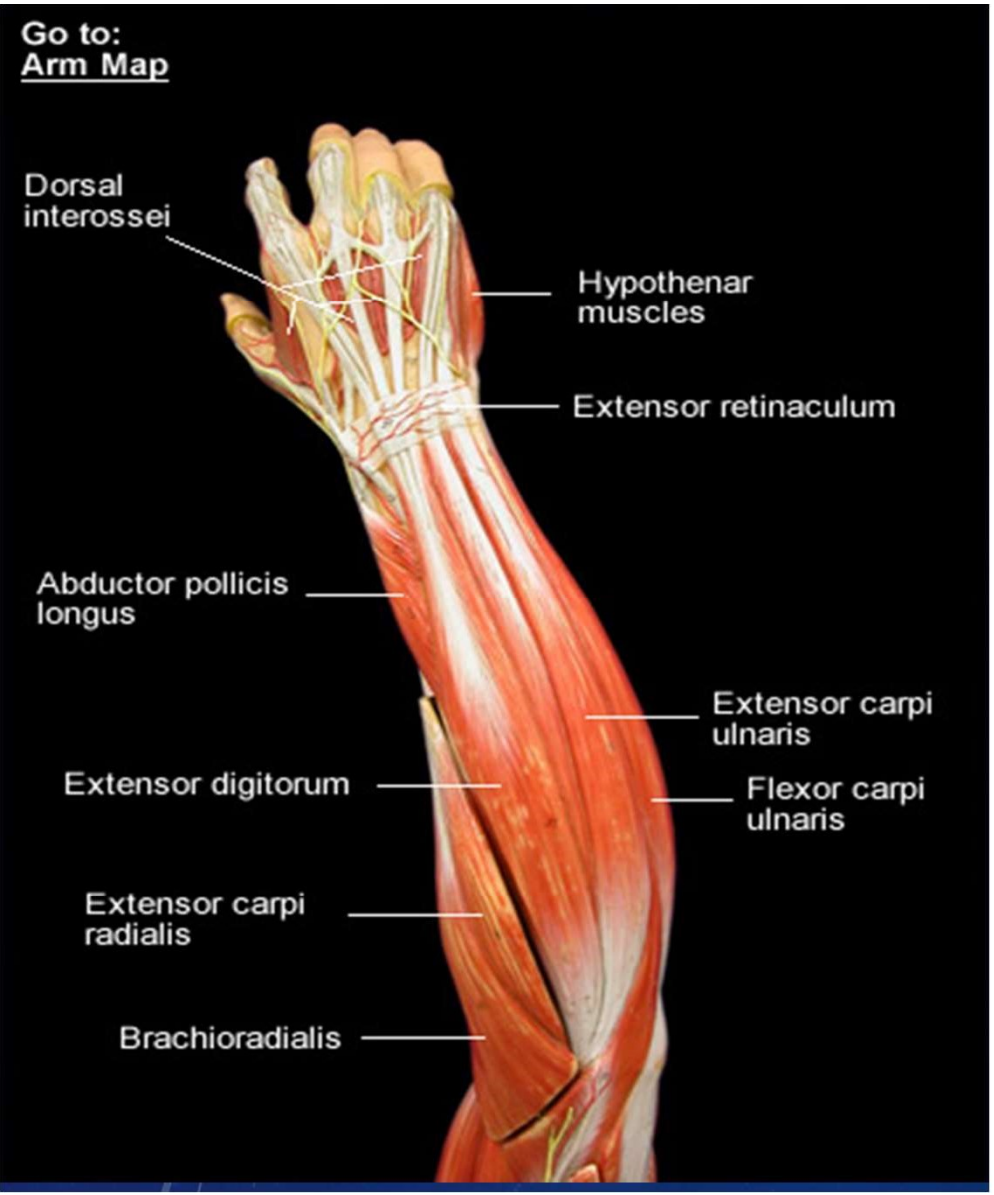

Pronates forearm and
assists in flexing elbow

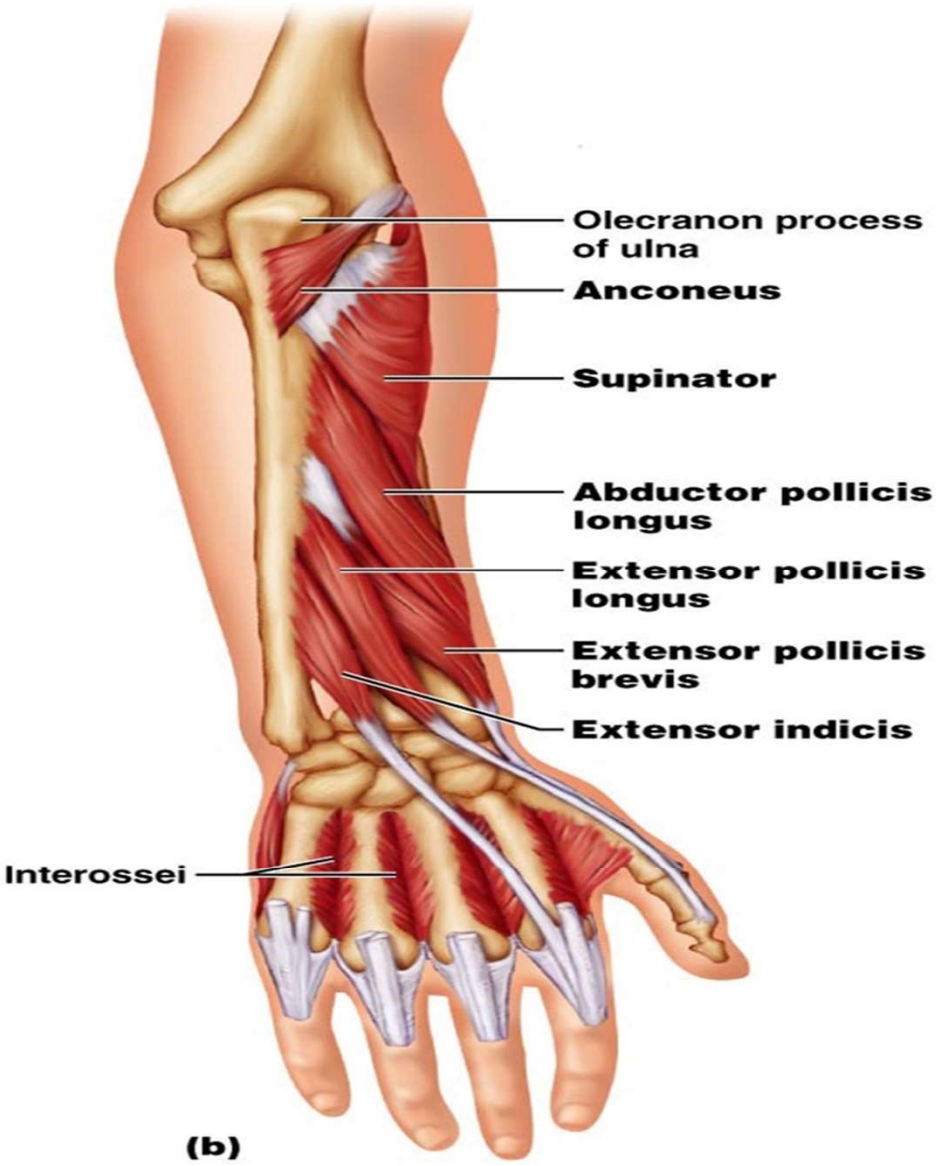

Pronator teres
Pronates forearm and
assists in flexing elbow

*click to the next slide to check your answer

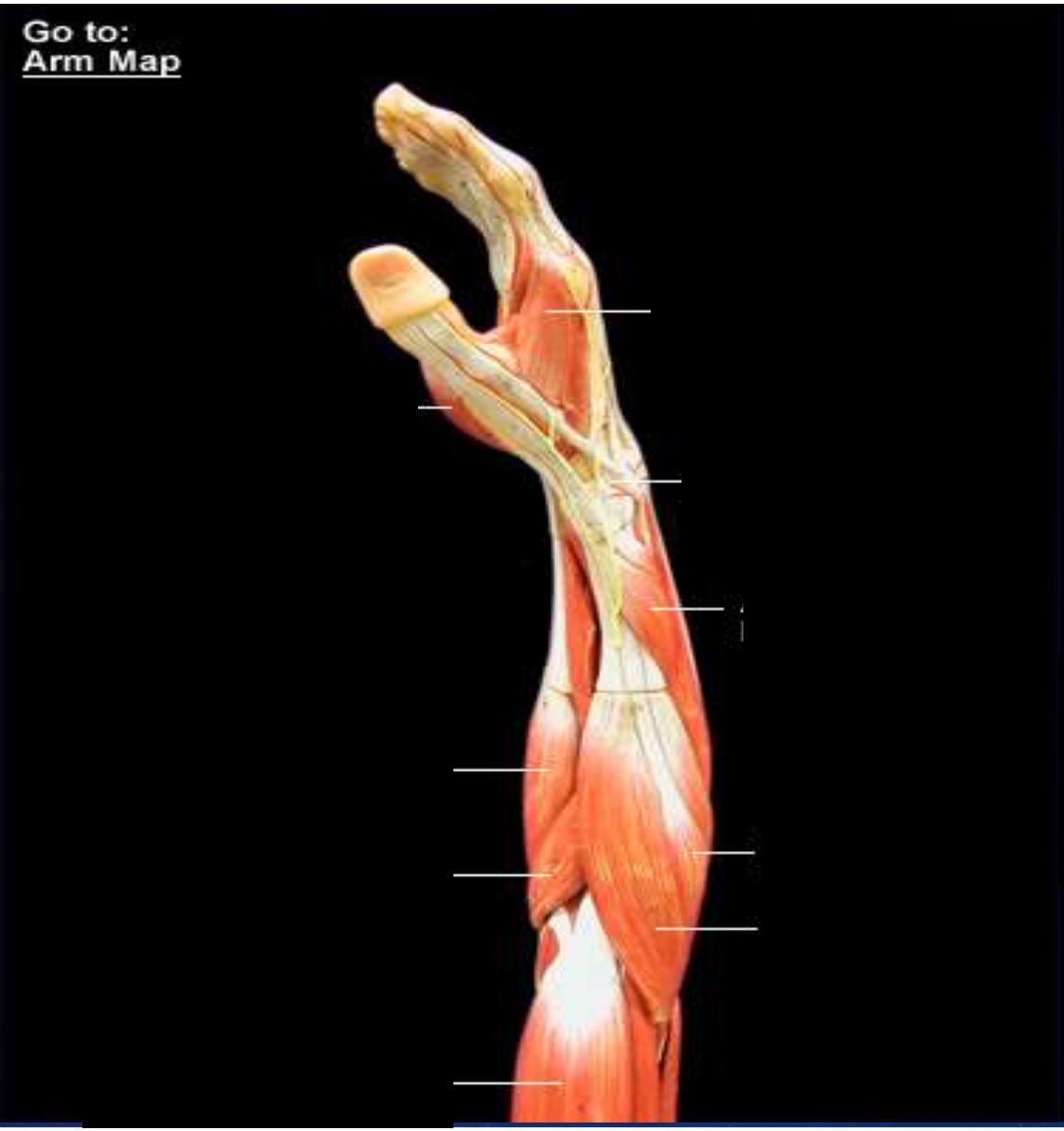
Action:
Abduction, flexion or extension of the arm at the shoulder


Go to:
Arm Map
Dorsal interossei
Hypothenar muscles
Extensor retinaculum

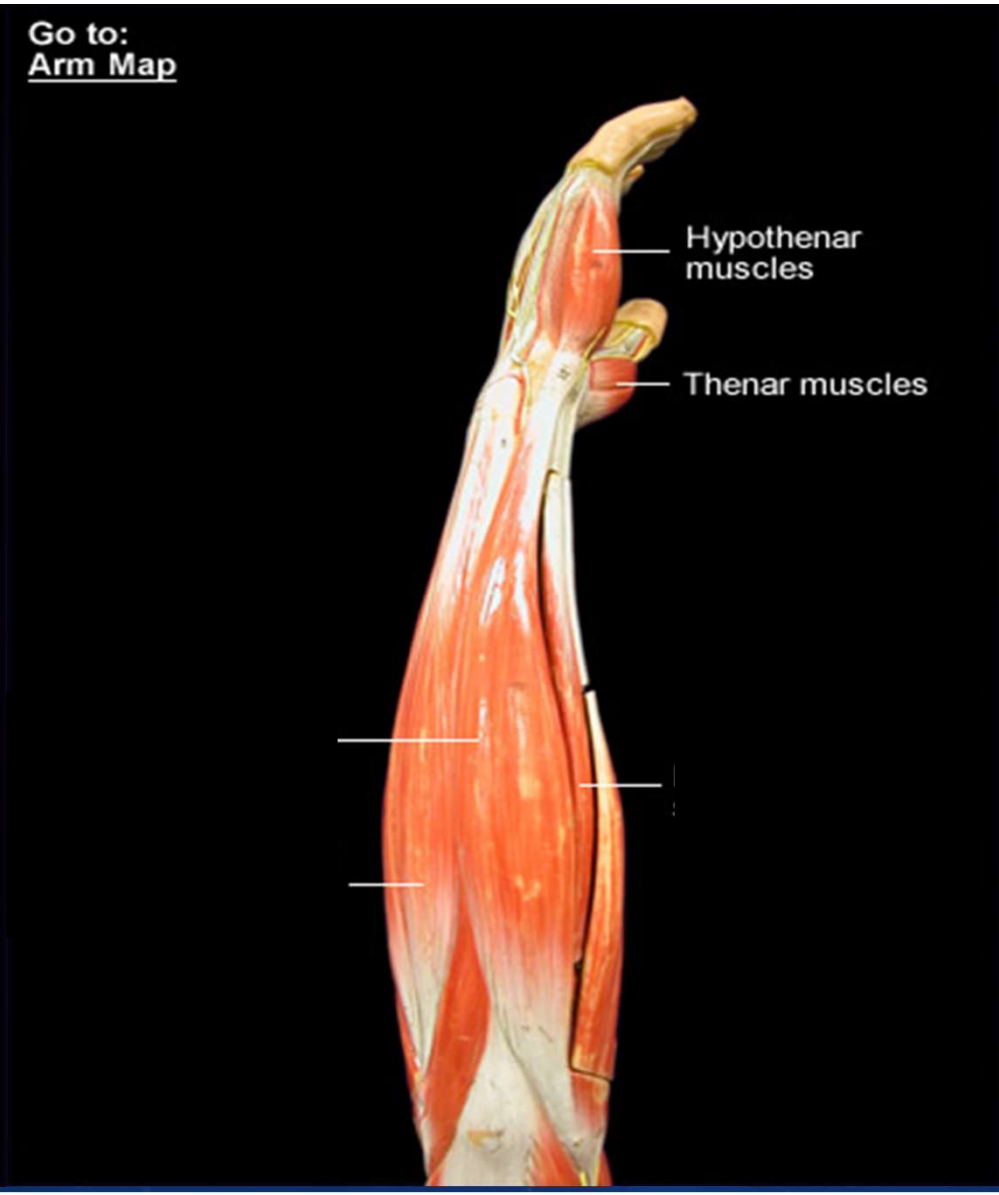

Go to:
Arm Map
Dorsal interossei
Hypothenar muscles
Extensor retinaculum
Abductor pollicis longus
Extensor carpi ulnaris
Extensor digitorum
Flexor carpi ulnaris
Extensor carpi radialis
Brachioradialis

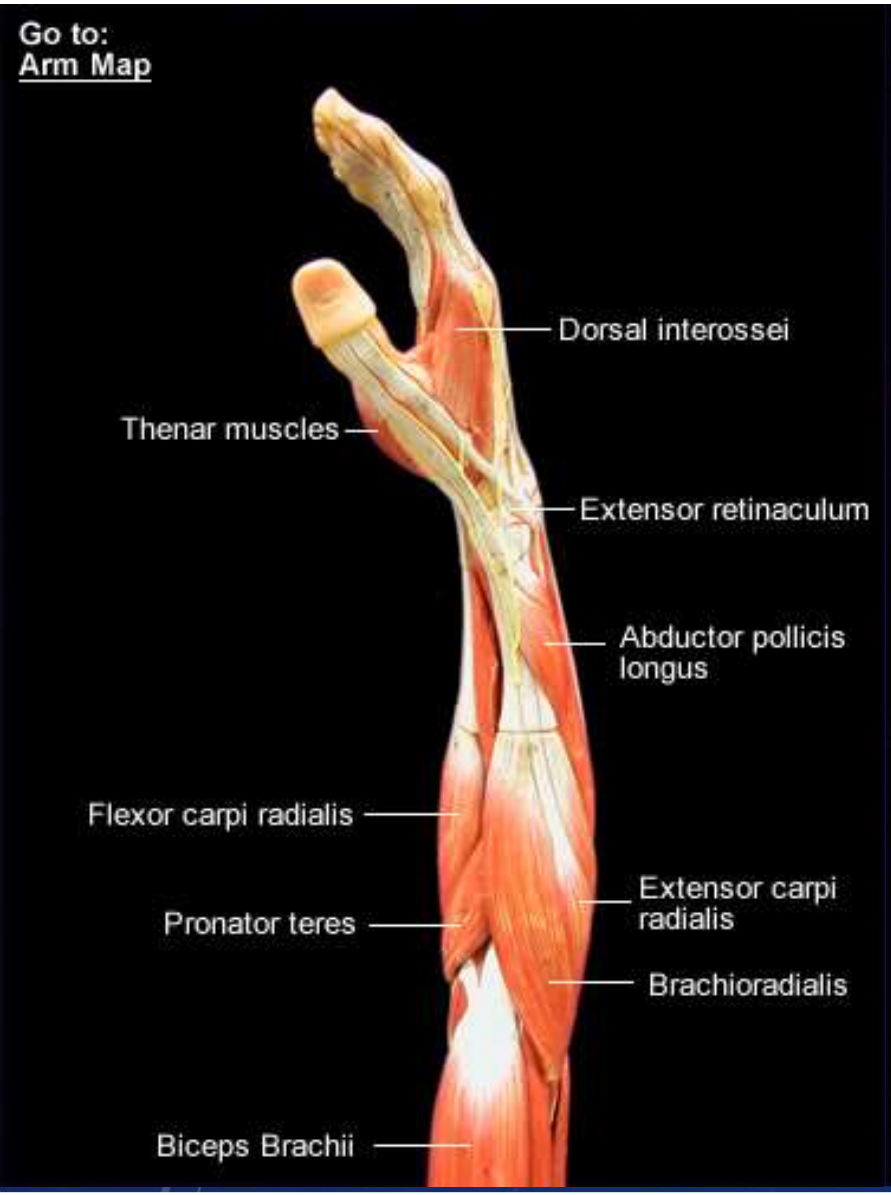

Olecranon process of ulna
Anconeus
Supinator
Abductor pollicis longus
Extensor pollicis longus
Extensor pollicis brevis
Extensor indicis
Interossei
(b)

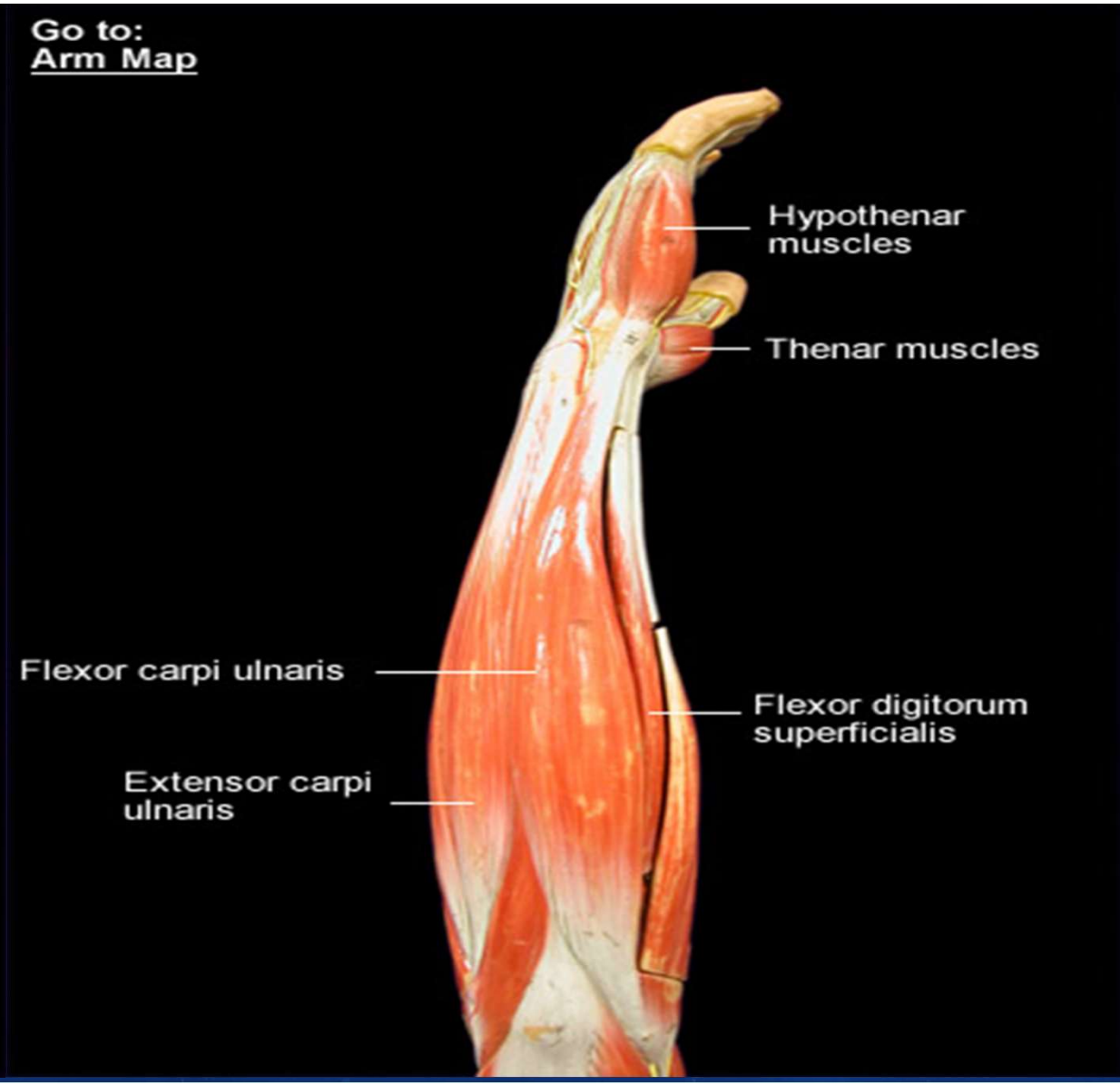
Go to:
Arm Map



Go to:
Arm Map




Go to:
Arm Map
Dorsal interossei
Thenar muscles
Extensor retinaculum
Abductor pollicis longus
Flexor carpi radialis
Extensor carpi radialis
Pronator teres
Brachioradialis
Biceps Brachii

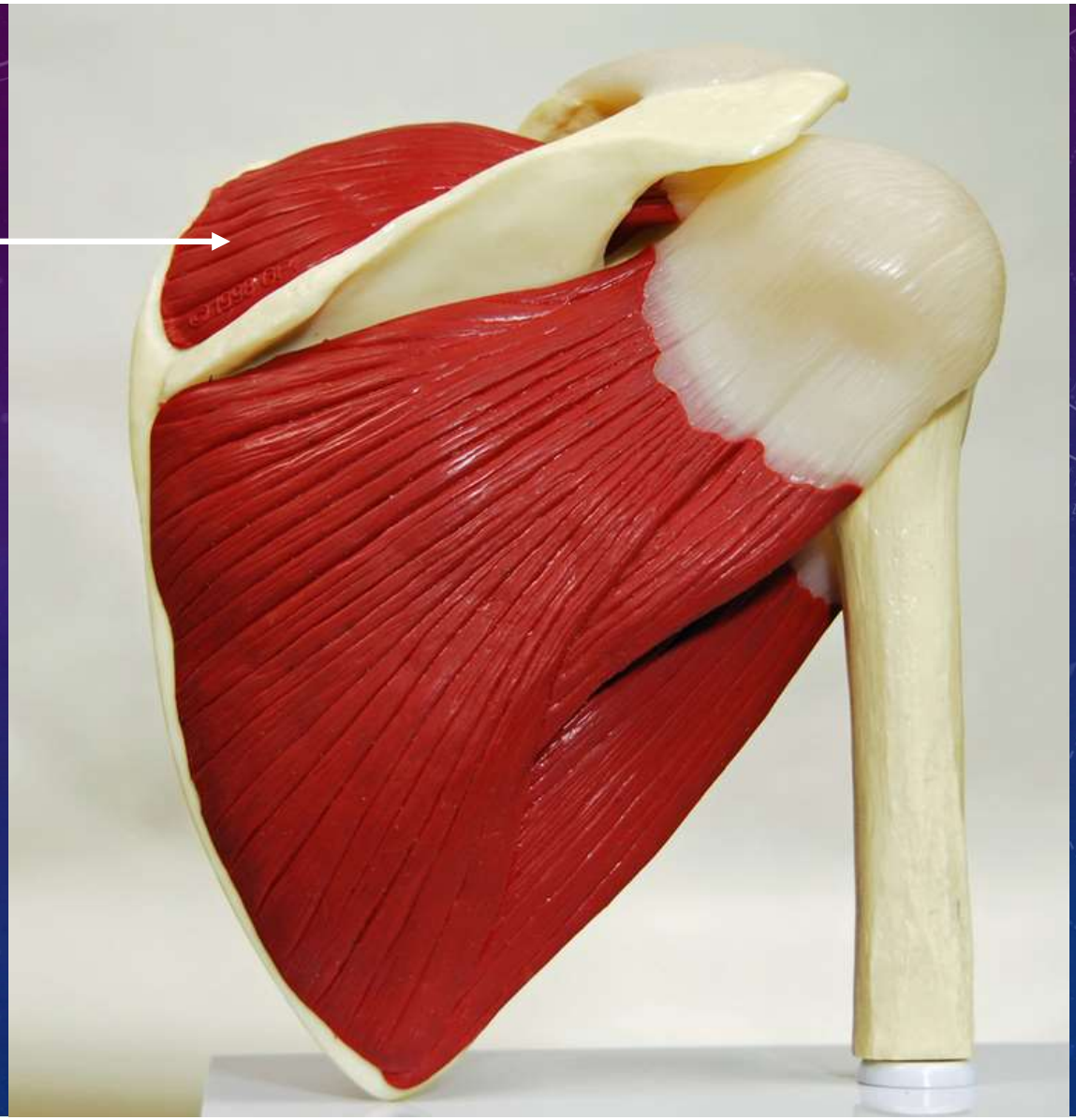

Go to:
Arm Map
Hypothenar muscles
Thenar muscles
Flexor carpi ulnaris
Flexor digitorum superficialis
Extensor carpi ulnaris

*click to the next slide to check your answer

Action: Flexion and abduction (radial deviation) at the wrist

*click to the next slide to check your answer

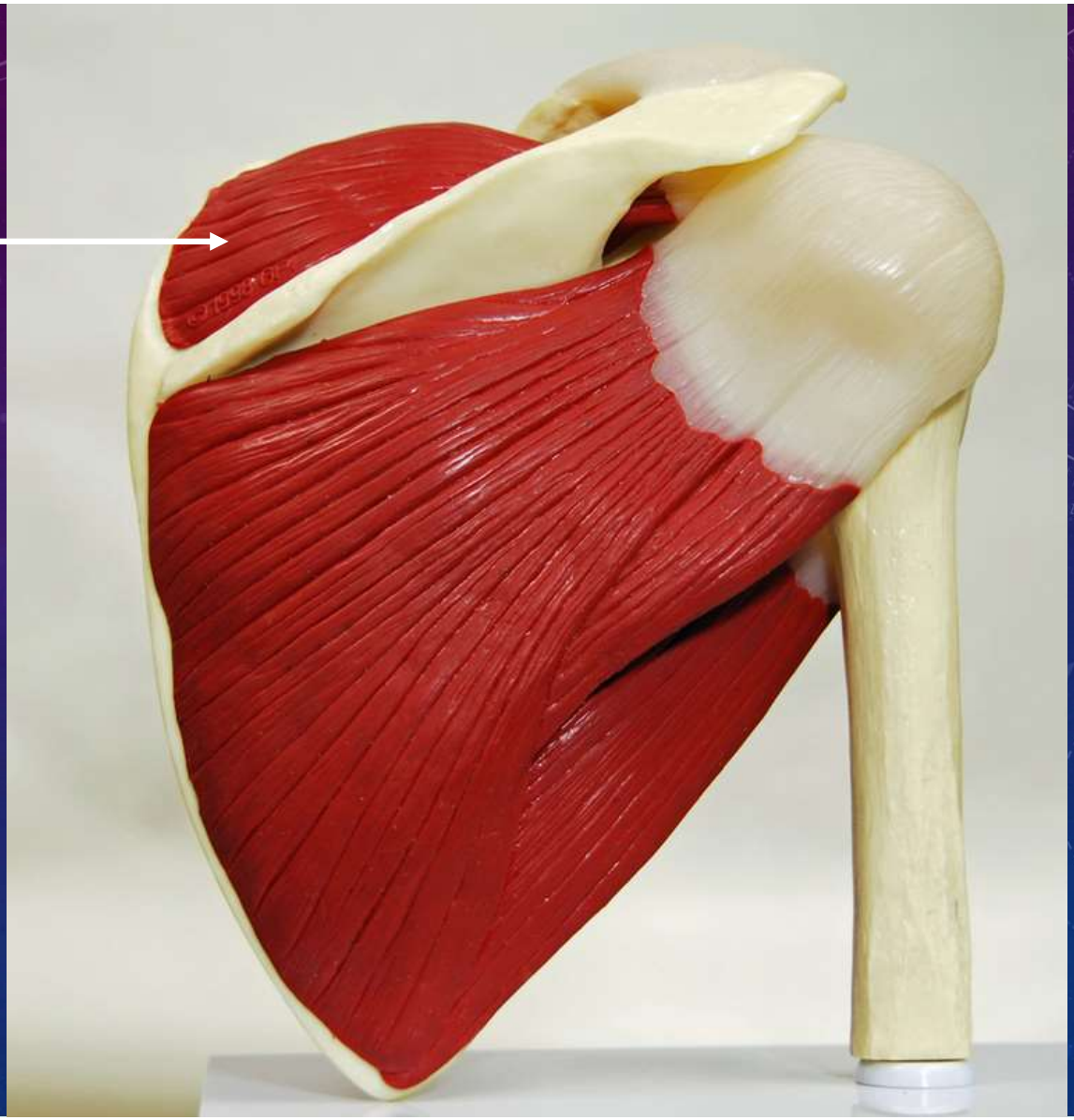
Action: Supination of the forearm

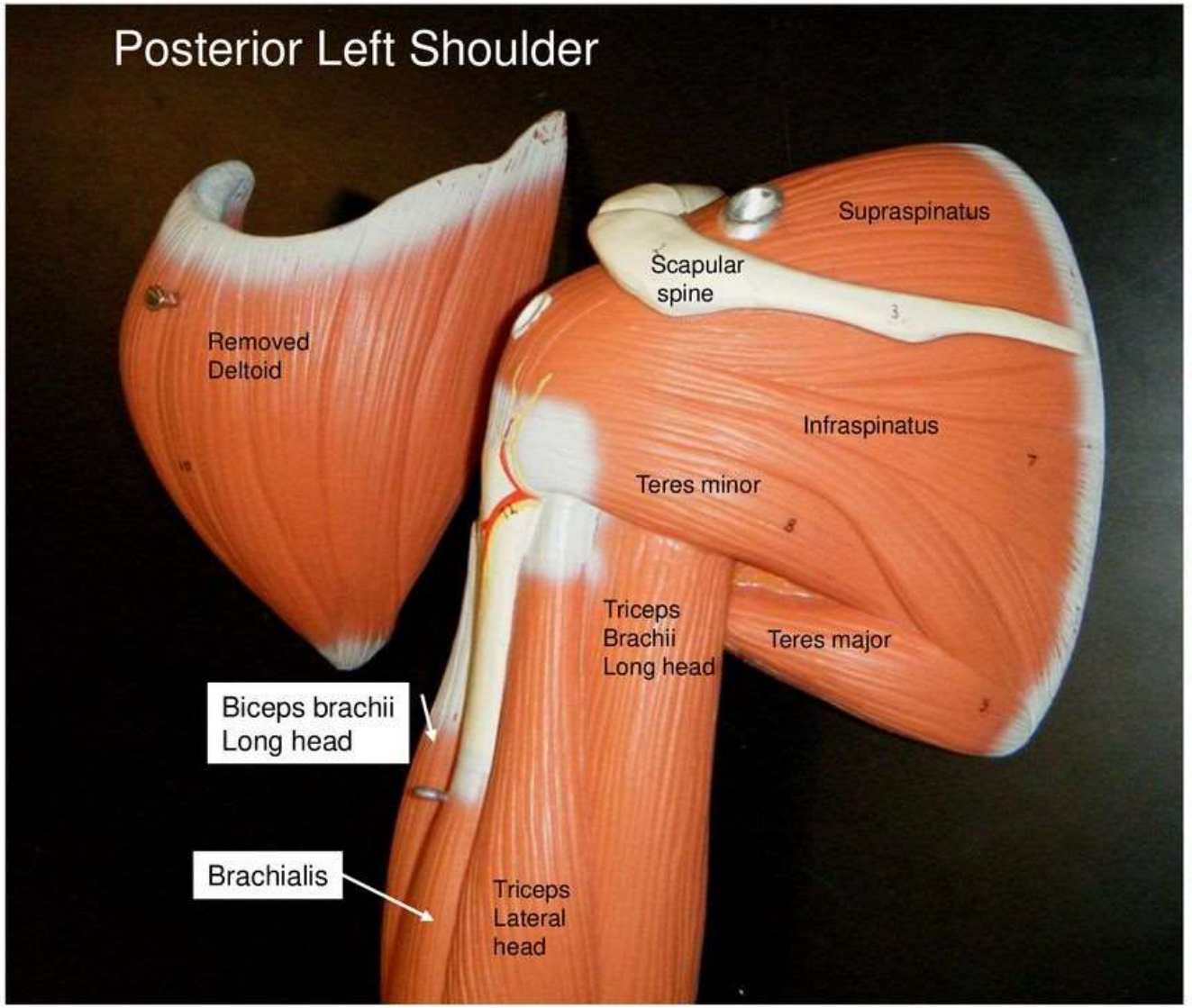


*click to the next slide to check your answer

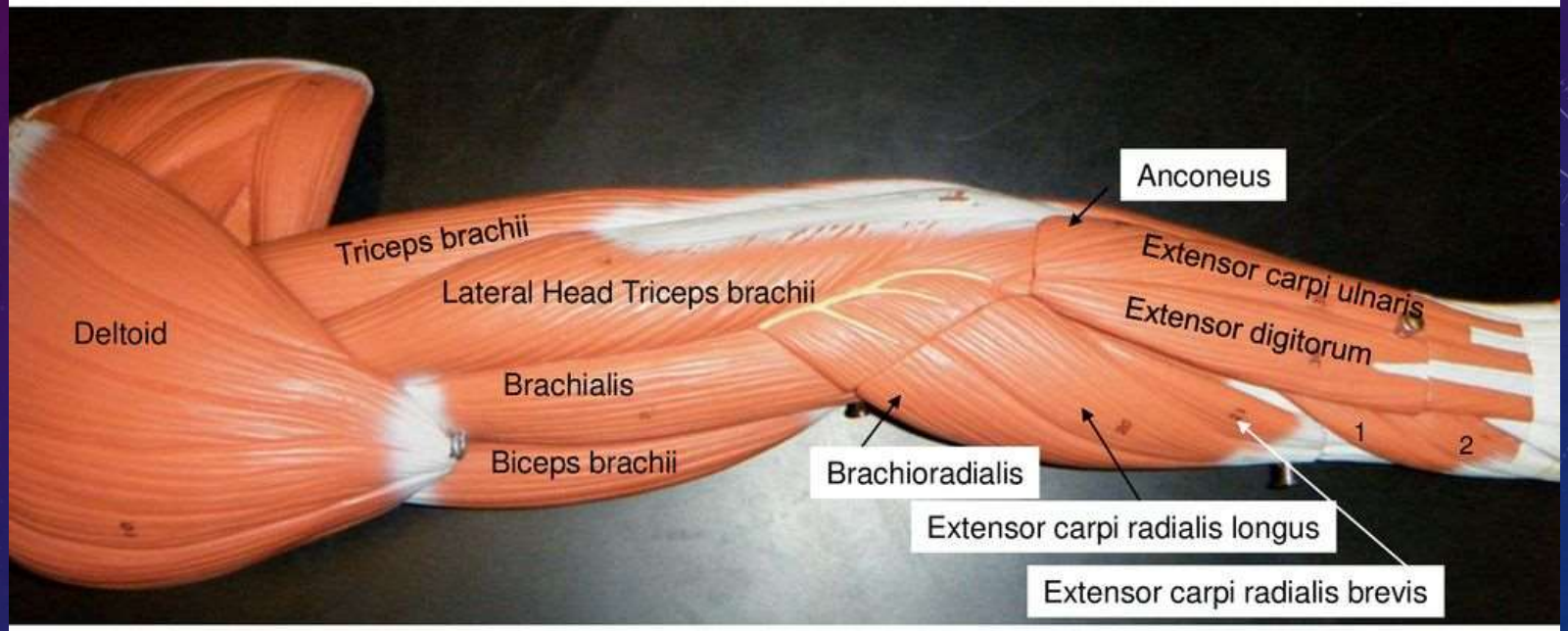
Supraspinatus

Action: Abduction of the arm at the shoulder



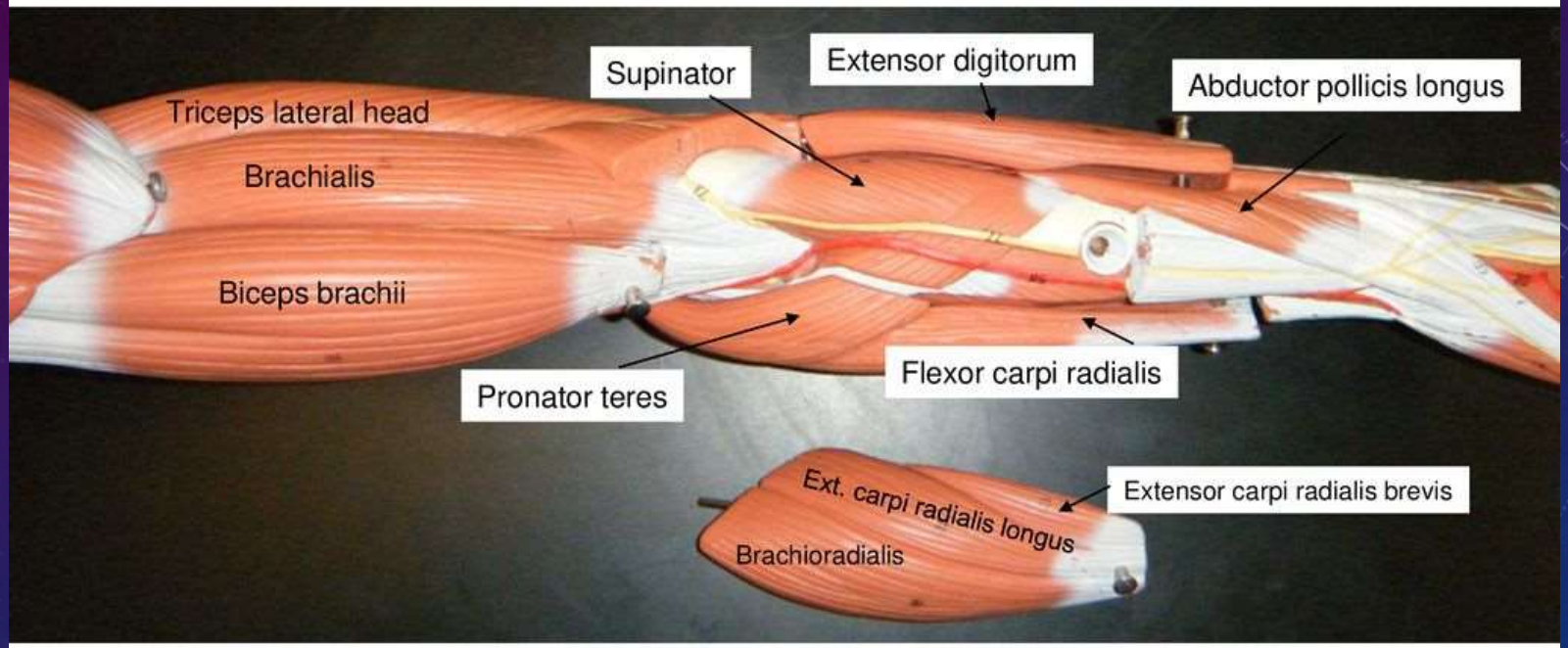

Posterior Left Shoulder
Supraspinatus
Scapular spine
Removed Deltoid
Infraspinatus
Teres minor
Triceps Brachii Long head
Teres major
Biceps brachii Long head
Brachialis
Triceps Lateral head

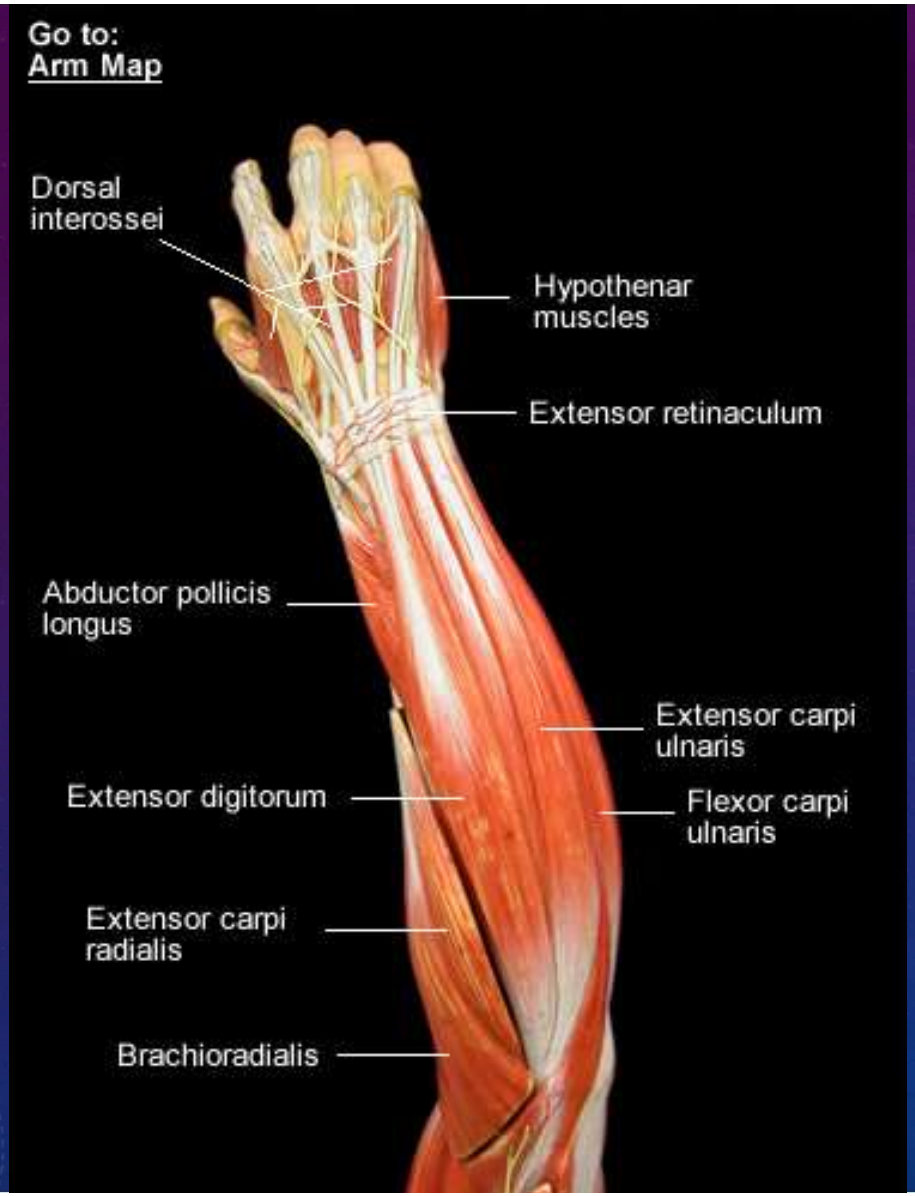
Posterior Left Arm

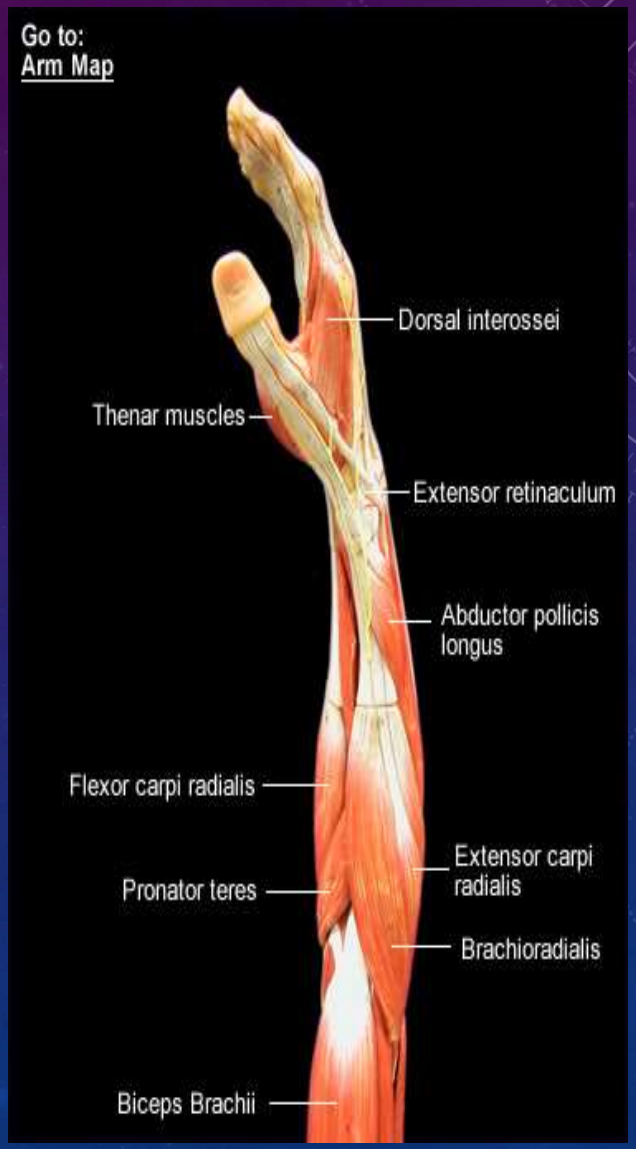


1. Abductor pollicis longus
2. Extensor pollicis longus

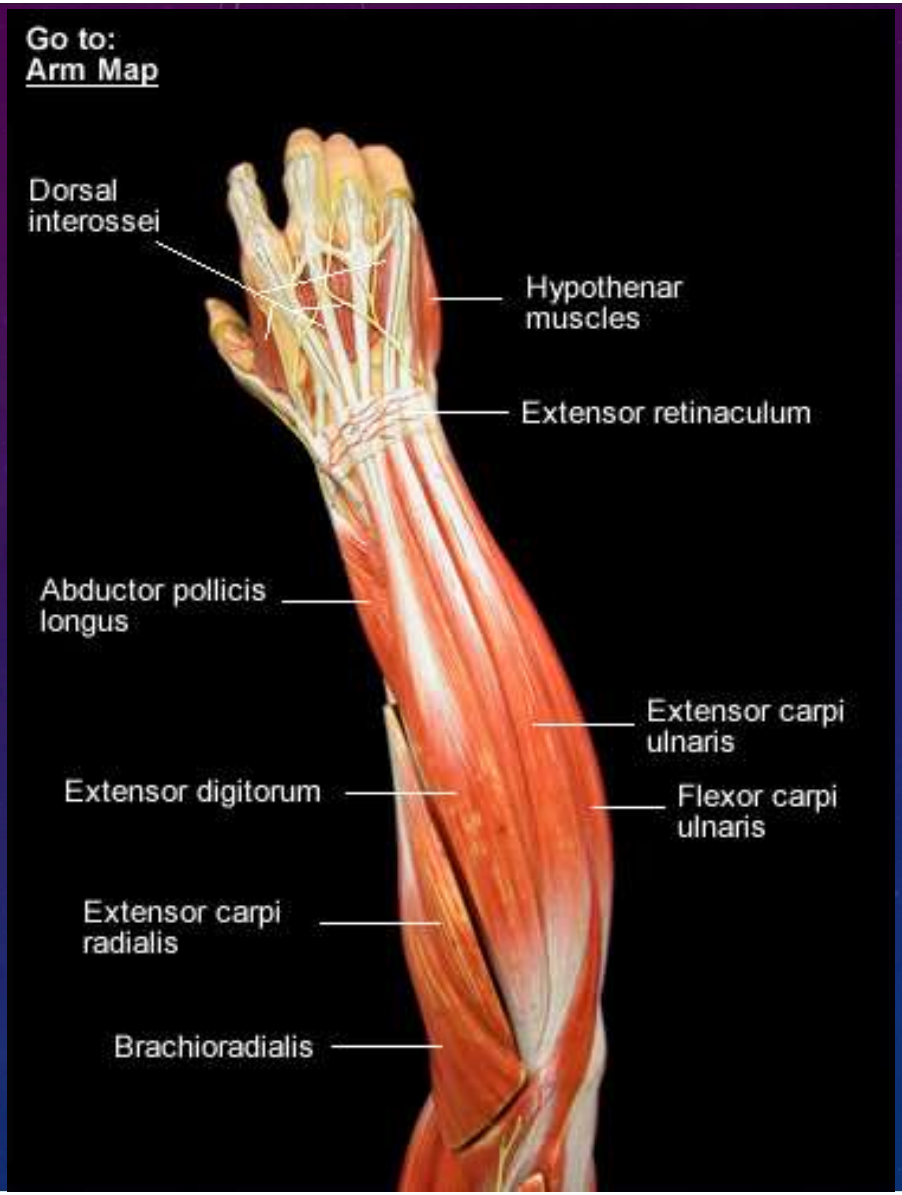
Posterior Left Arm - Superficial Lower arm muscles removed

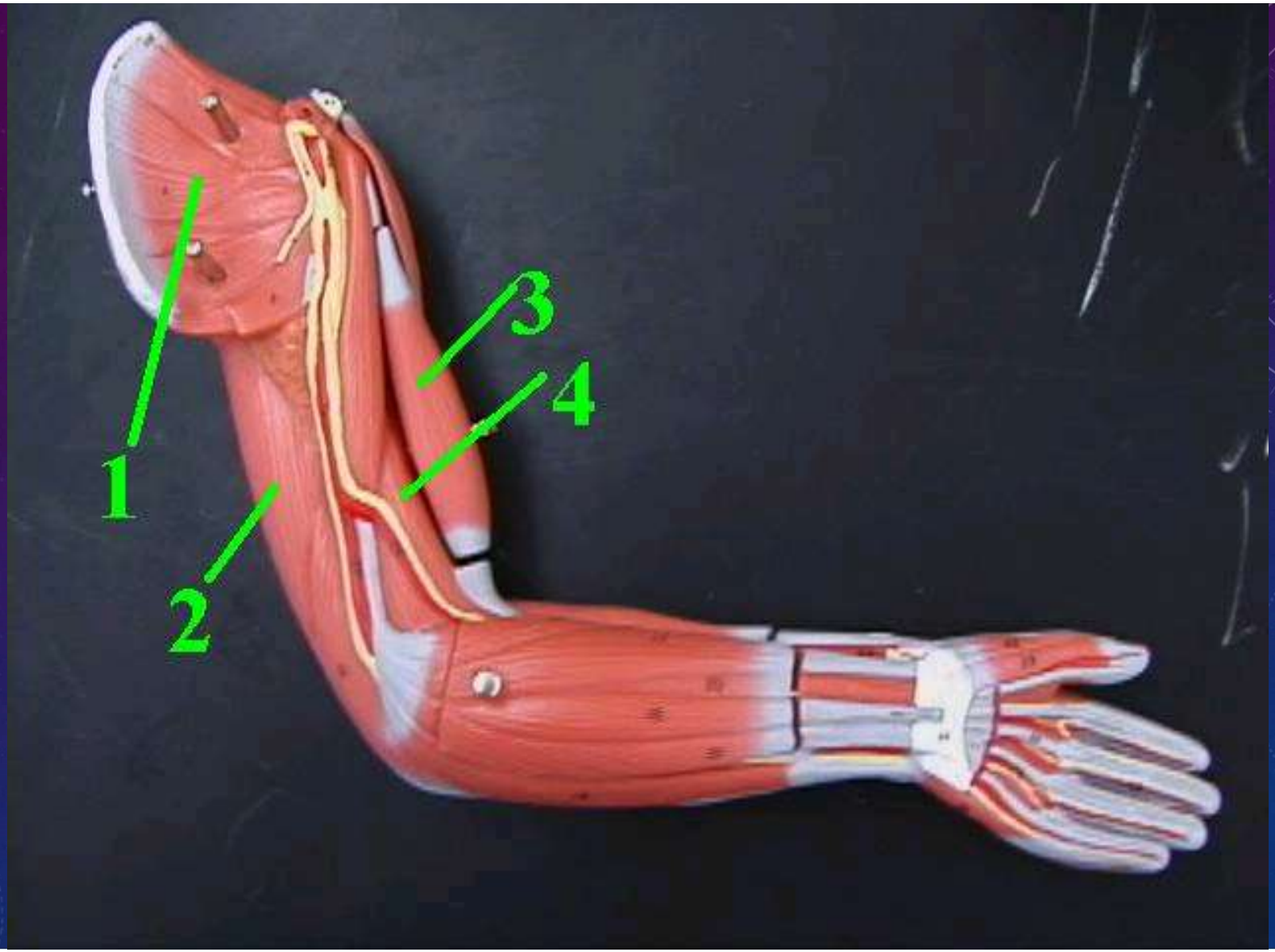


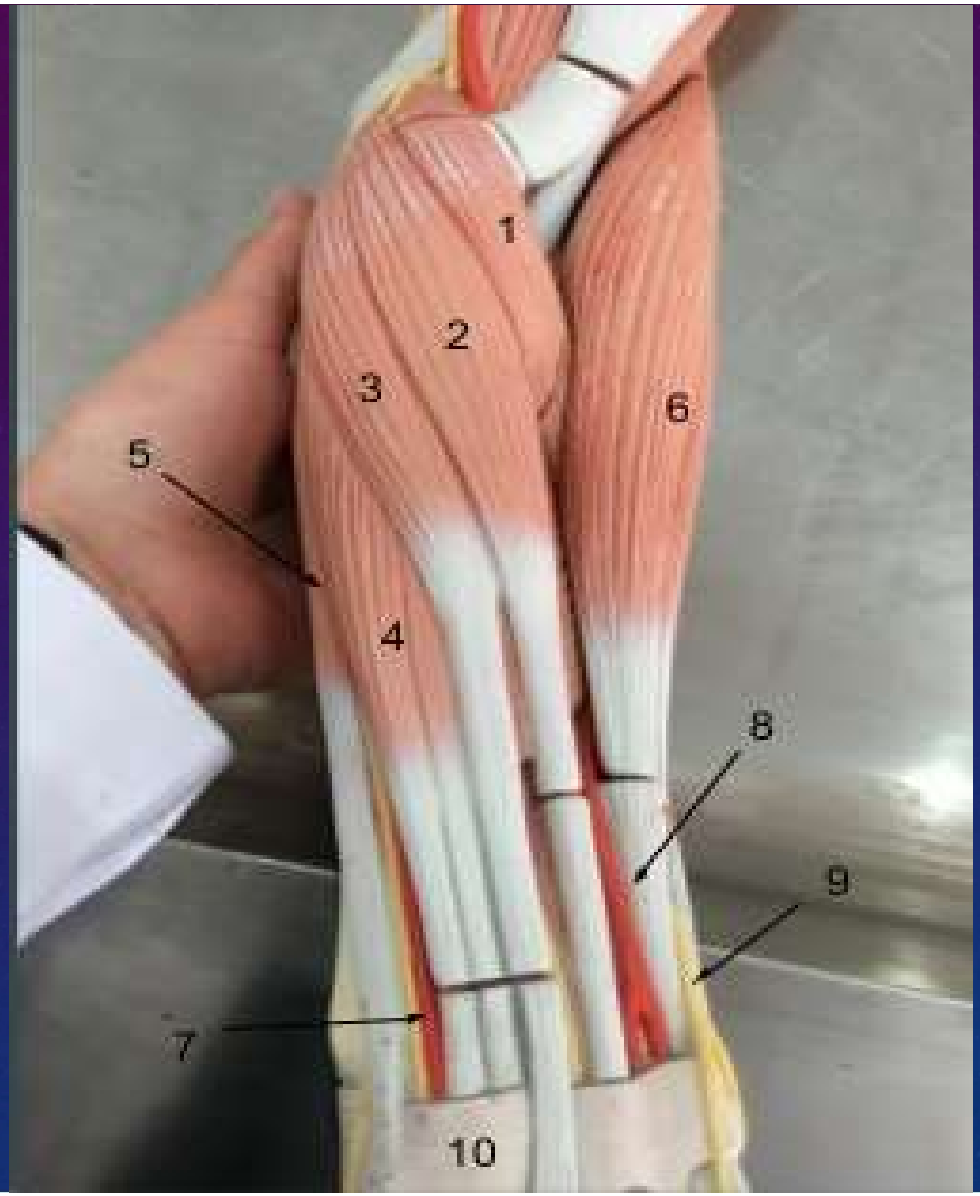

Go to:
Arm Map
Dorsal interossei
Hypothenar muscles
Extensor retinaculum
Abductor pollicis longus
Extensor carpi ulnaris
Extensor digitorum
Flexor carpi ulnaris
Extensor carpi radialis
Brachioradialis


Go to:
Arm Map
Dorsal interossei
Thenar muscles
Extensor retinaculum
Abductor pollicis longus
Flexor carpi radialis
Extensor carpi radialis
Pronator teres
Brachioradialis
Biceps Brachii

Go to:
Arm Map


Dorsal interossei
Hypothenar muscles
Extensor retinaculum
Abductor pollicis longus
Extensor carpi ulnaris
Extensor digitorum
Flexor carpi ulnaris
Extensor carpi radialis
Brachioradialis


1
2
3
4


1
2
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4
5
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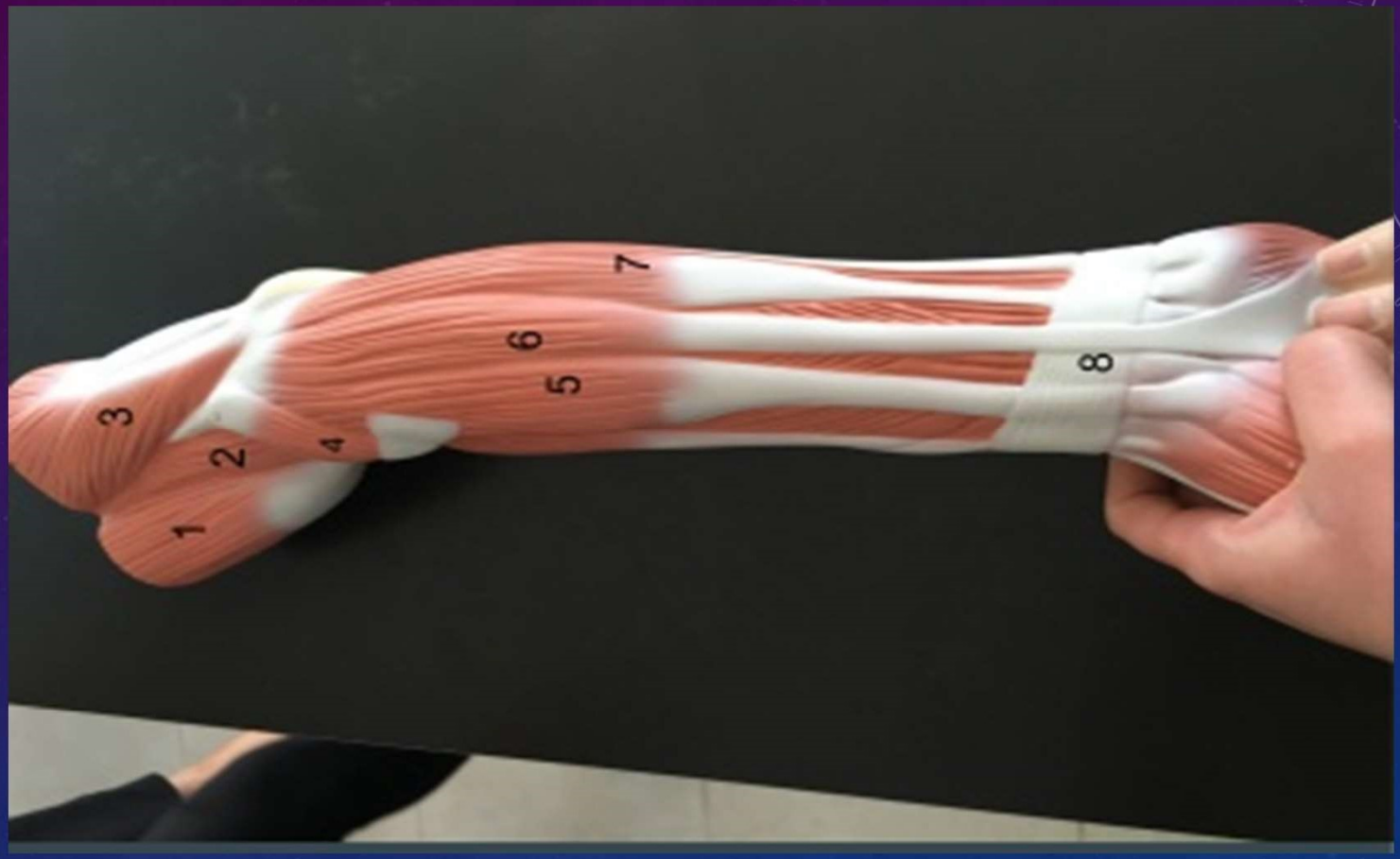
7
8
9
10

Upper limb

Muscles , arteries & nerves

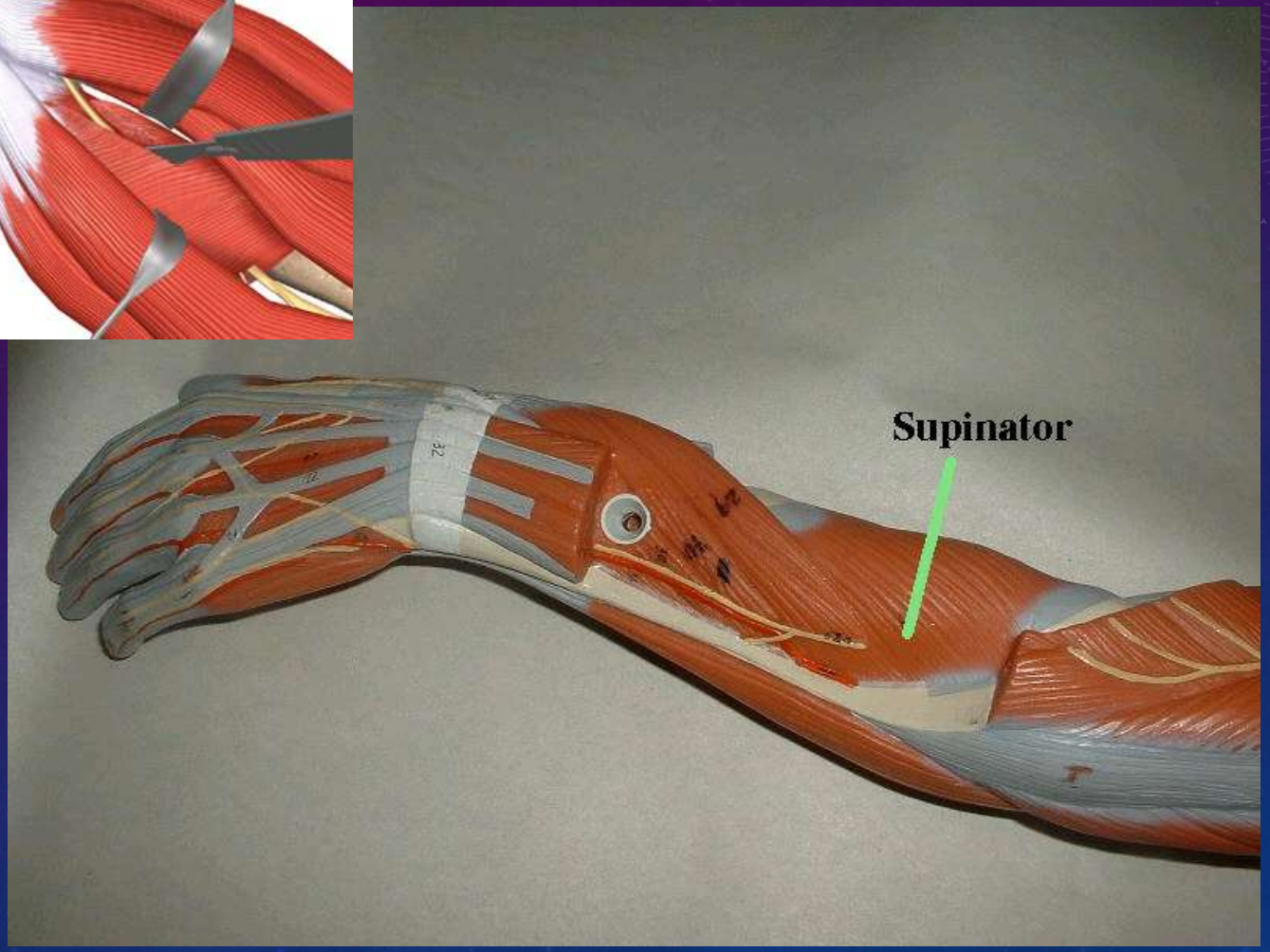
1. Pronator teres
2. Flexor carpi radialis
3. Palmaris longus
4. Flexor digitorum superficialis
5. Flexor carpi ulnaris
6. Brachioradialis
7. Ulnar artery & nerve
8. Radial artery
9. Superficial branch of radial nerve
10. Palmar carpal ligament

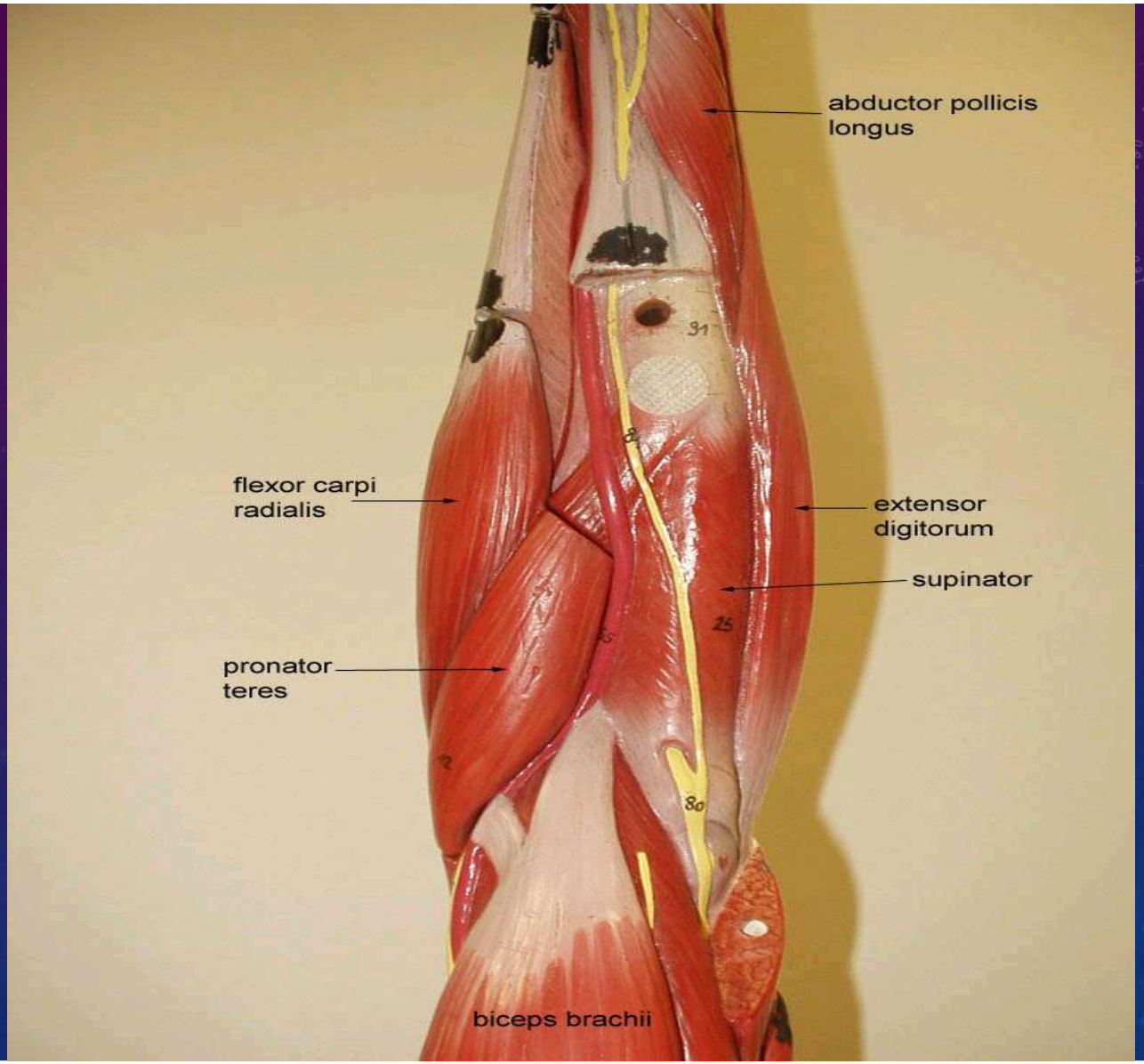

1
2
3
4
5
6
7
8

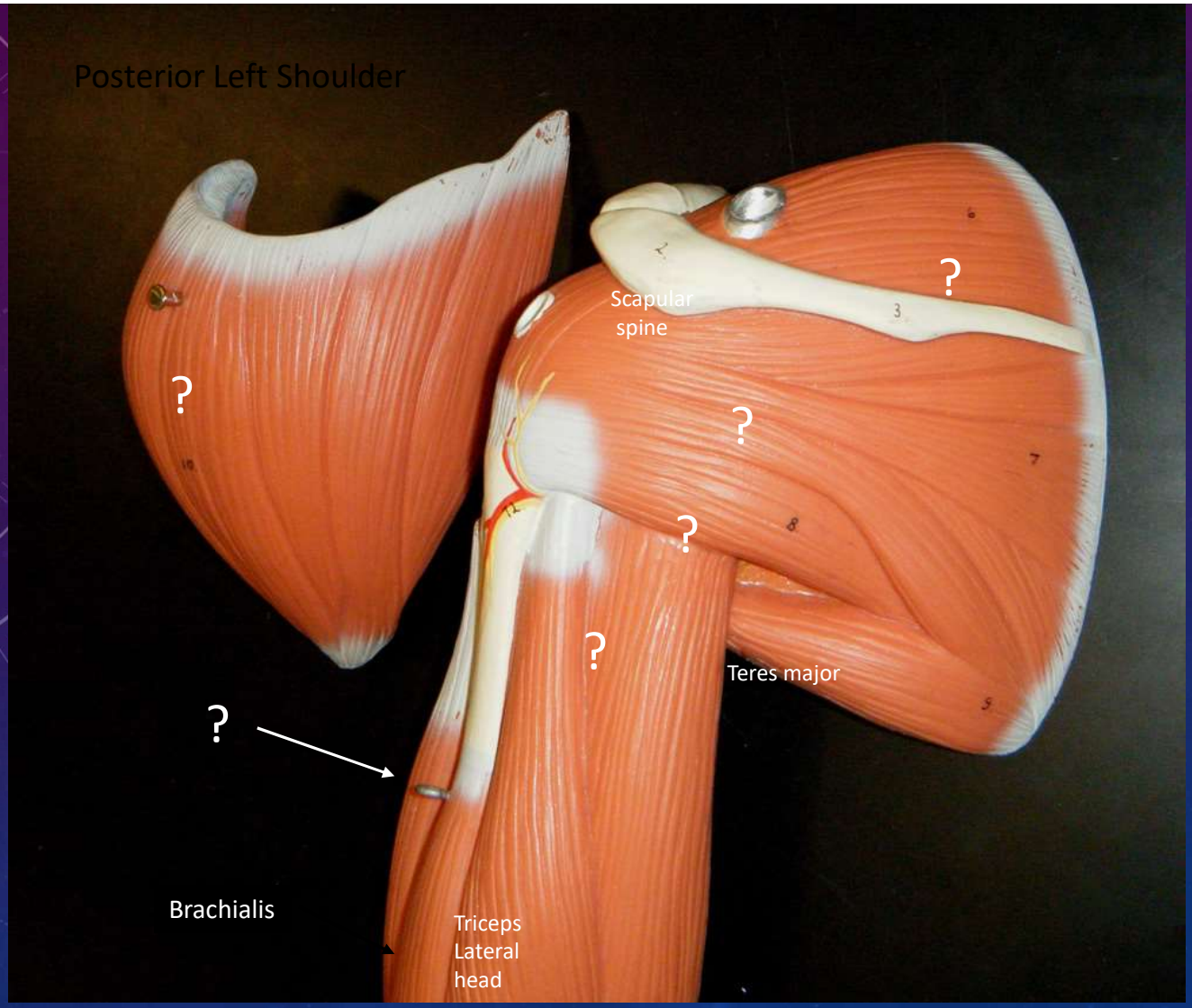
Upper limb

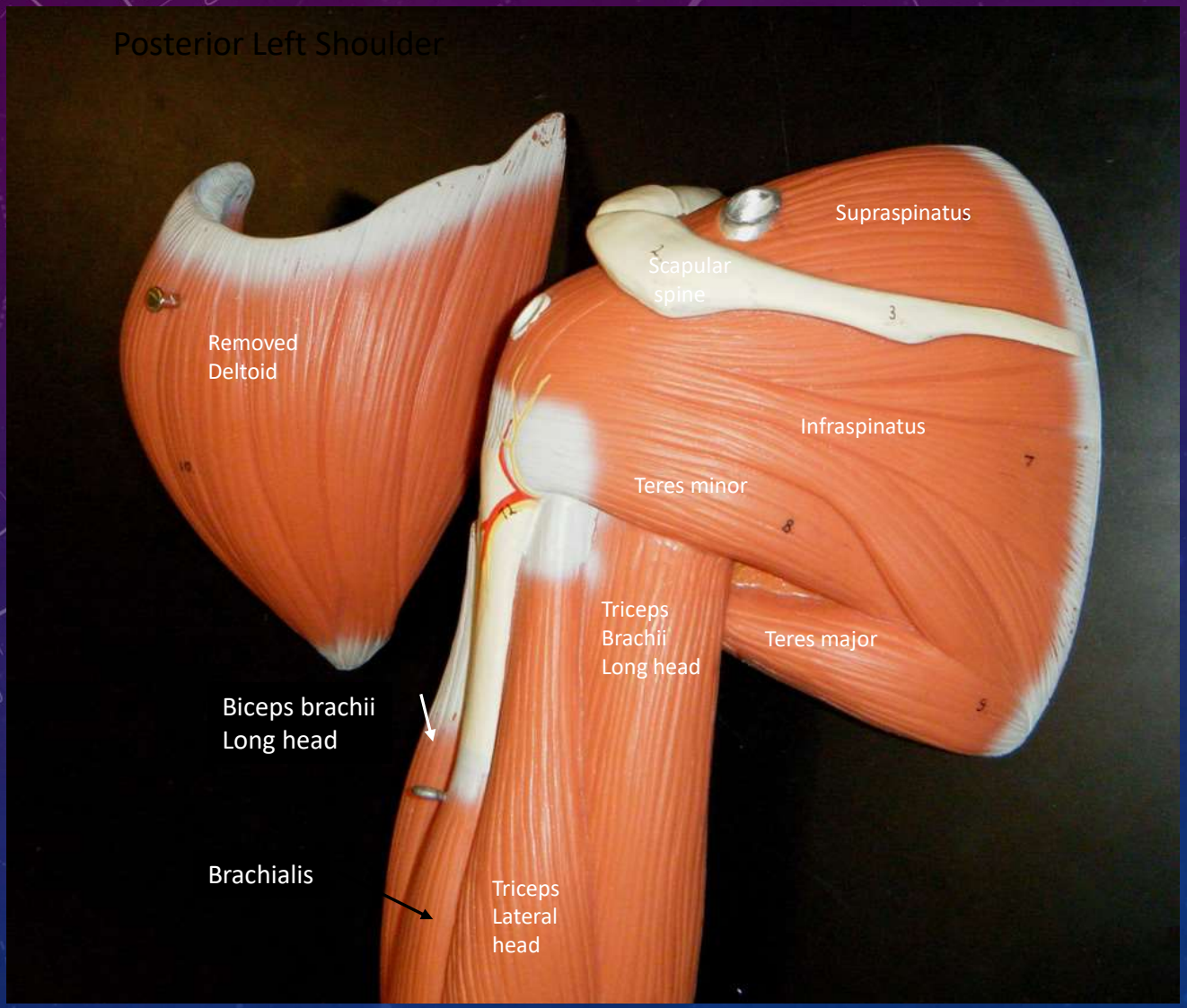
1. Biceps brachii
2. Brachialis
3. Triceps
4. Pronator teres
5. Flexor carpi radialis
6. Palmaris longus
7. Flexor carpi ulnaris
8. Palmar carpal ligament

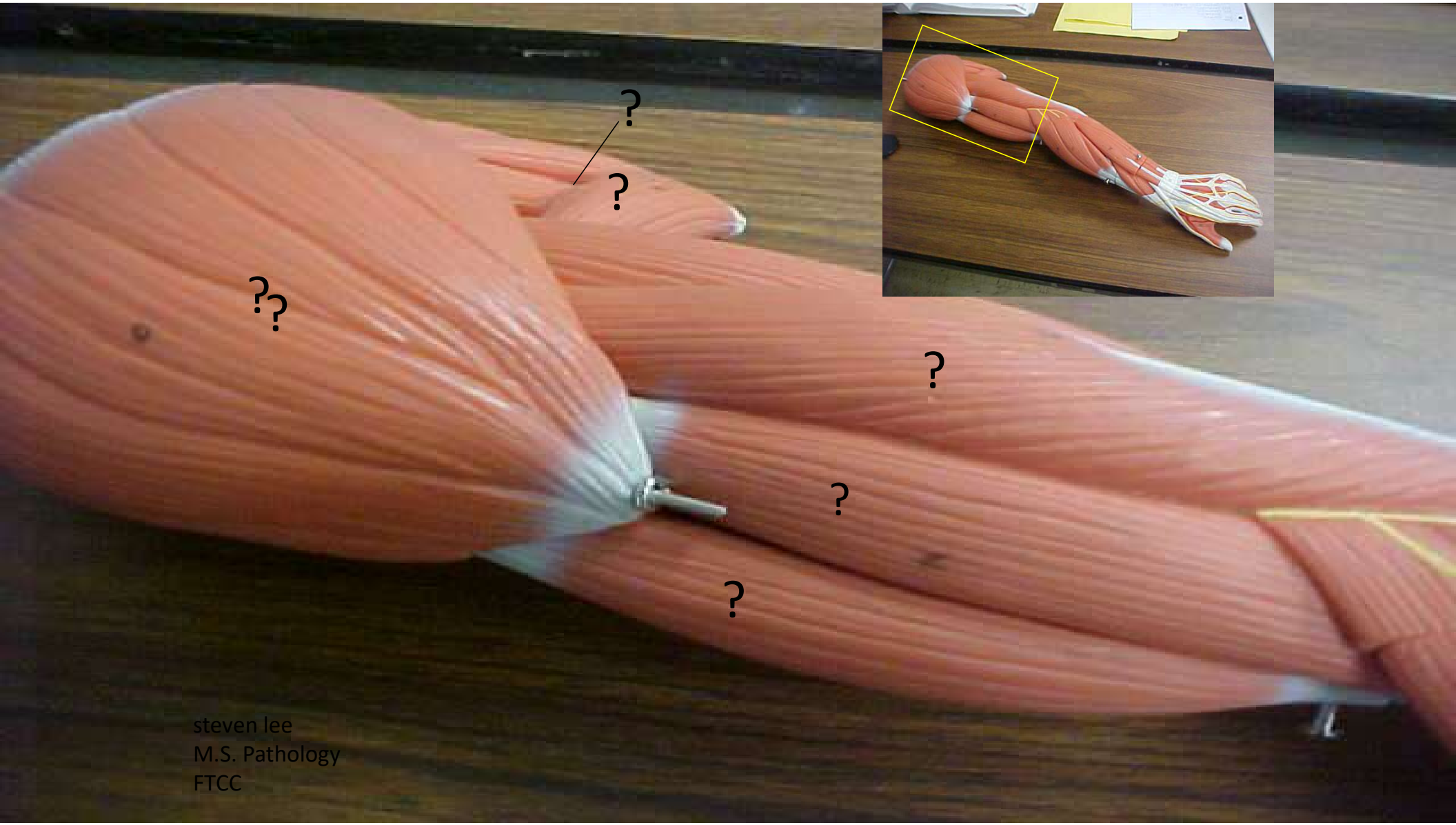

Supinator muscle
split over nerve
©MMG 2001


Supinator


abductor pollicis longus
flexor carpi radialis
extensor digitorum
supinator
pronator teres
biceps brachii

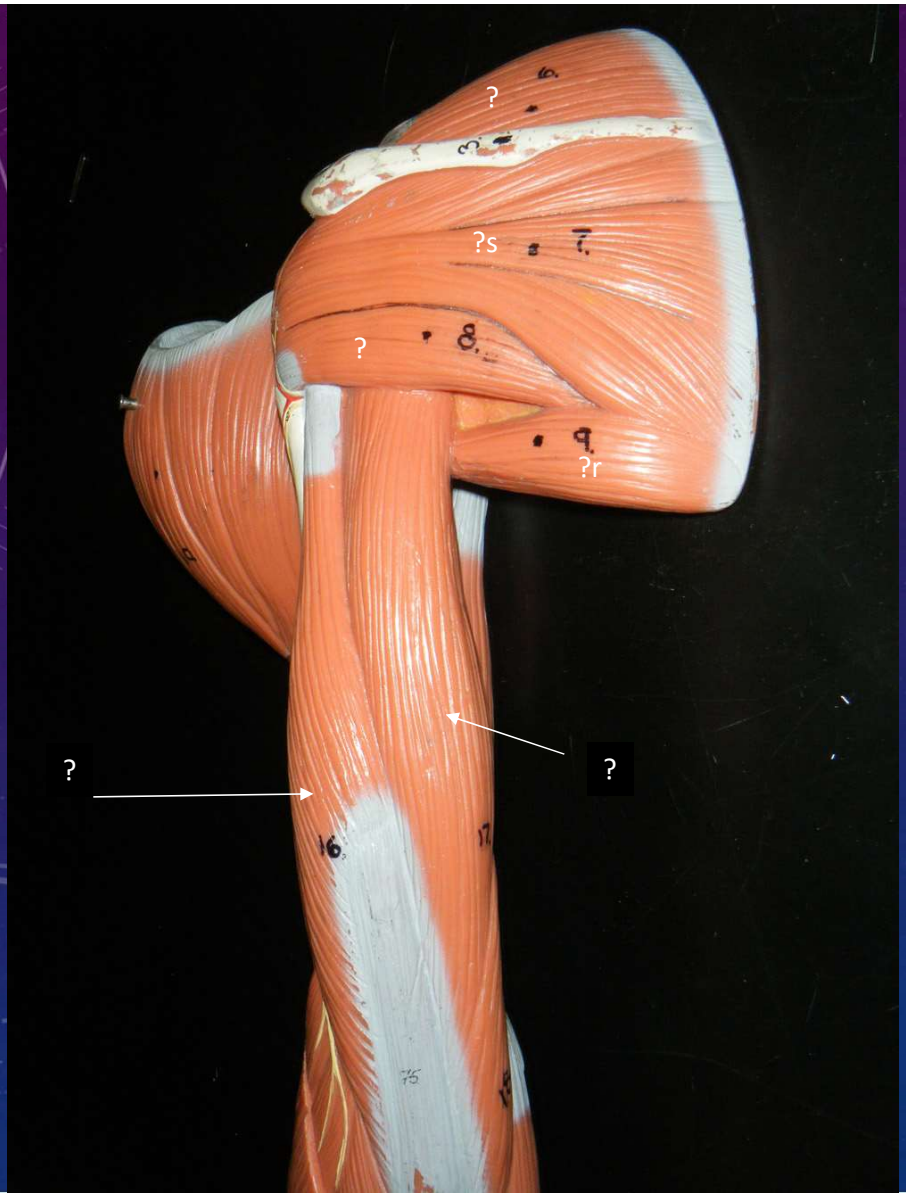

Posterior Left Shoulder
?
Scapular spine
?
?
?
?
Teres major
?
Brachialis
Triceps Lateral head


Posterior Left Shoulder
Supraspinatus
Scapular spine
Removed Deltoid
Infraspinatus
Teres minor
Triceps Brachii Long head
Teres major
Biceps brachii Long head
Brachialis
Triceps Lateral head

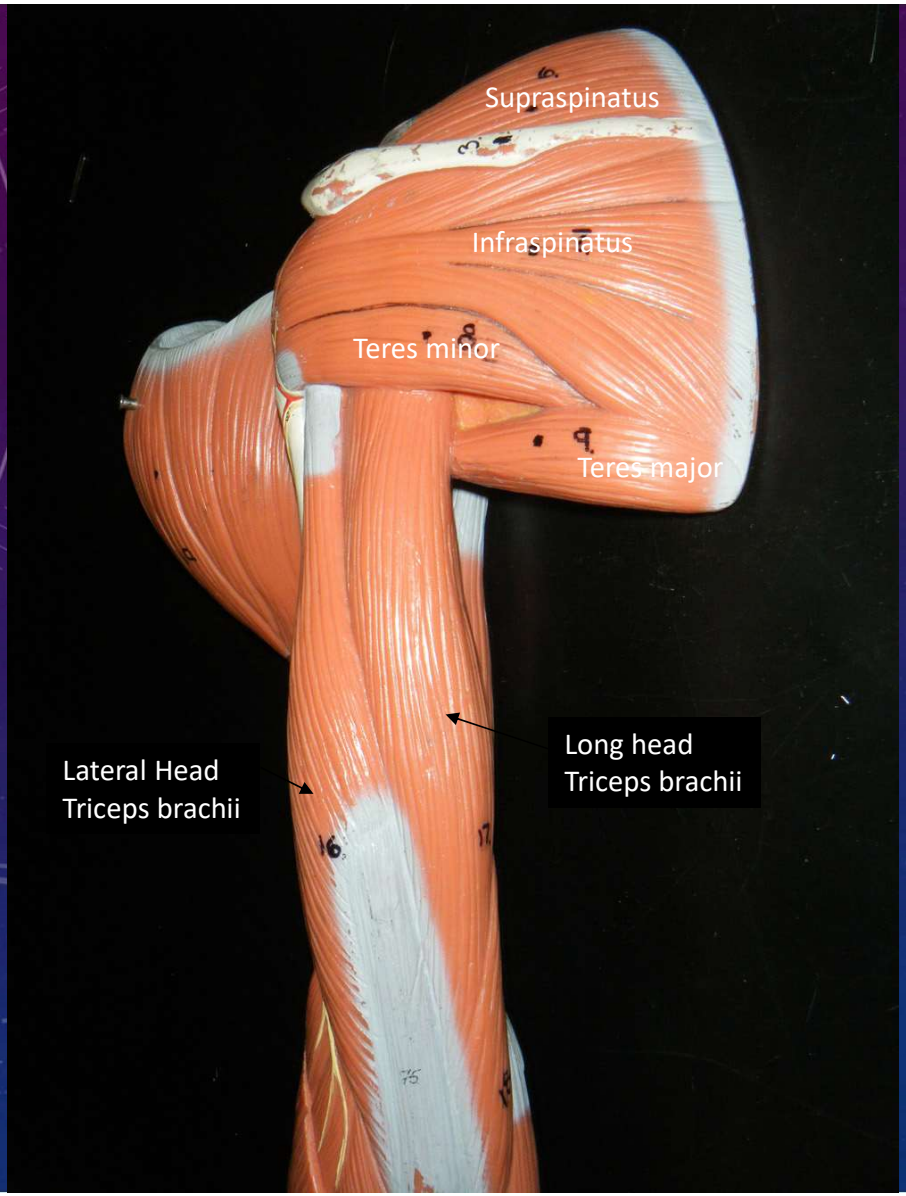

?
?
??
?
?
?
steven lee
M.S. Pathology
FTCC


Teres minor
Teres major
deltoid
Triceps brachii
brachialis
Biceps brachii
steven lee
M.S. Pathology
FTCC

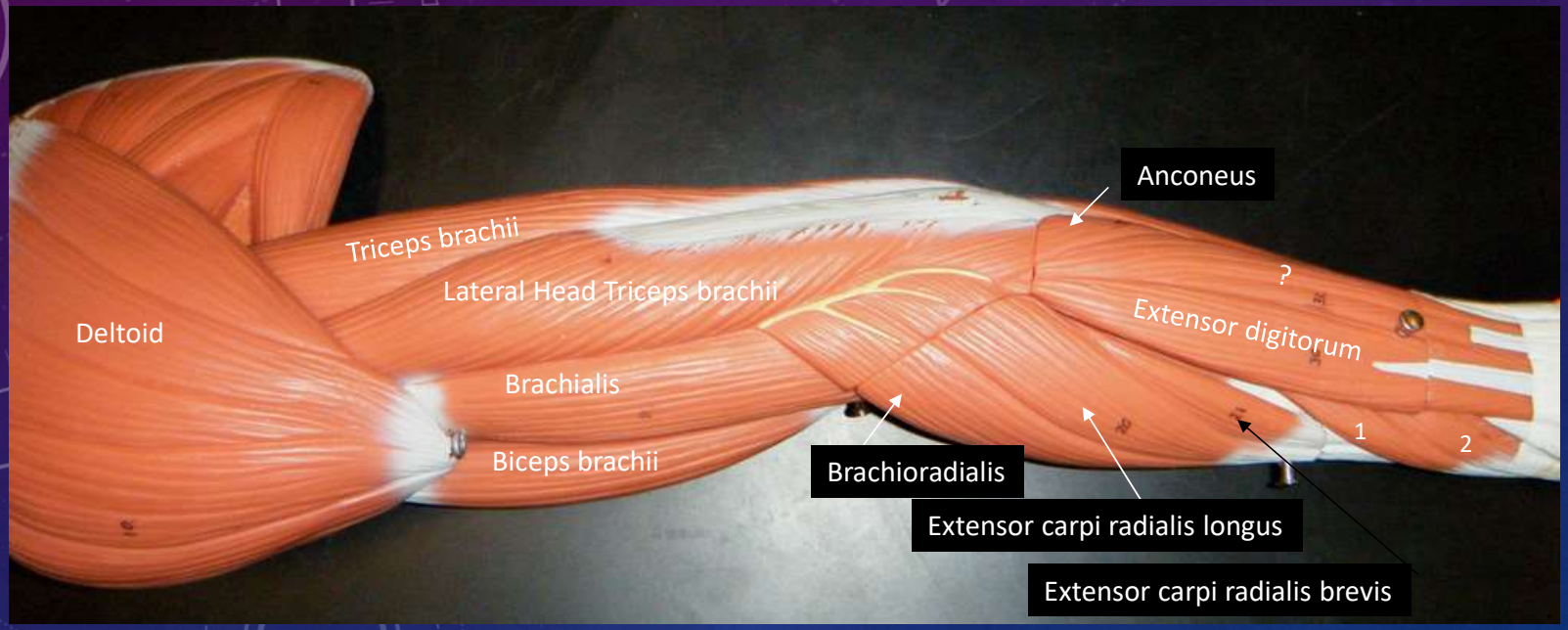
Posterior Left Shoulder & Upper Arm Deltoid removed



Posterior Left Shoulder & Upper Arm Deltoid removed

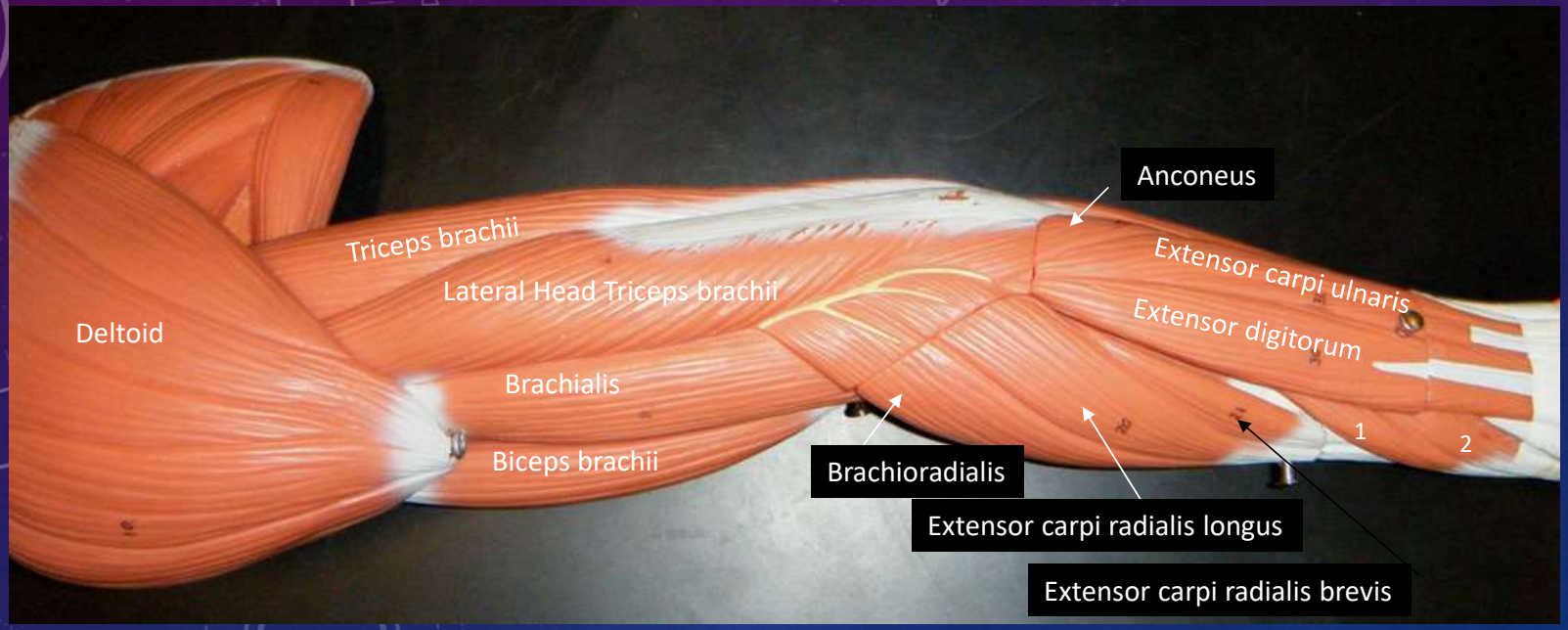


POSTERIOR LEFT ARM

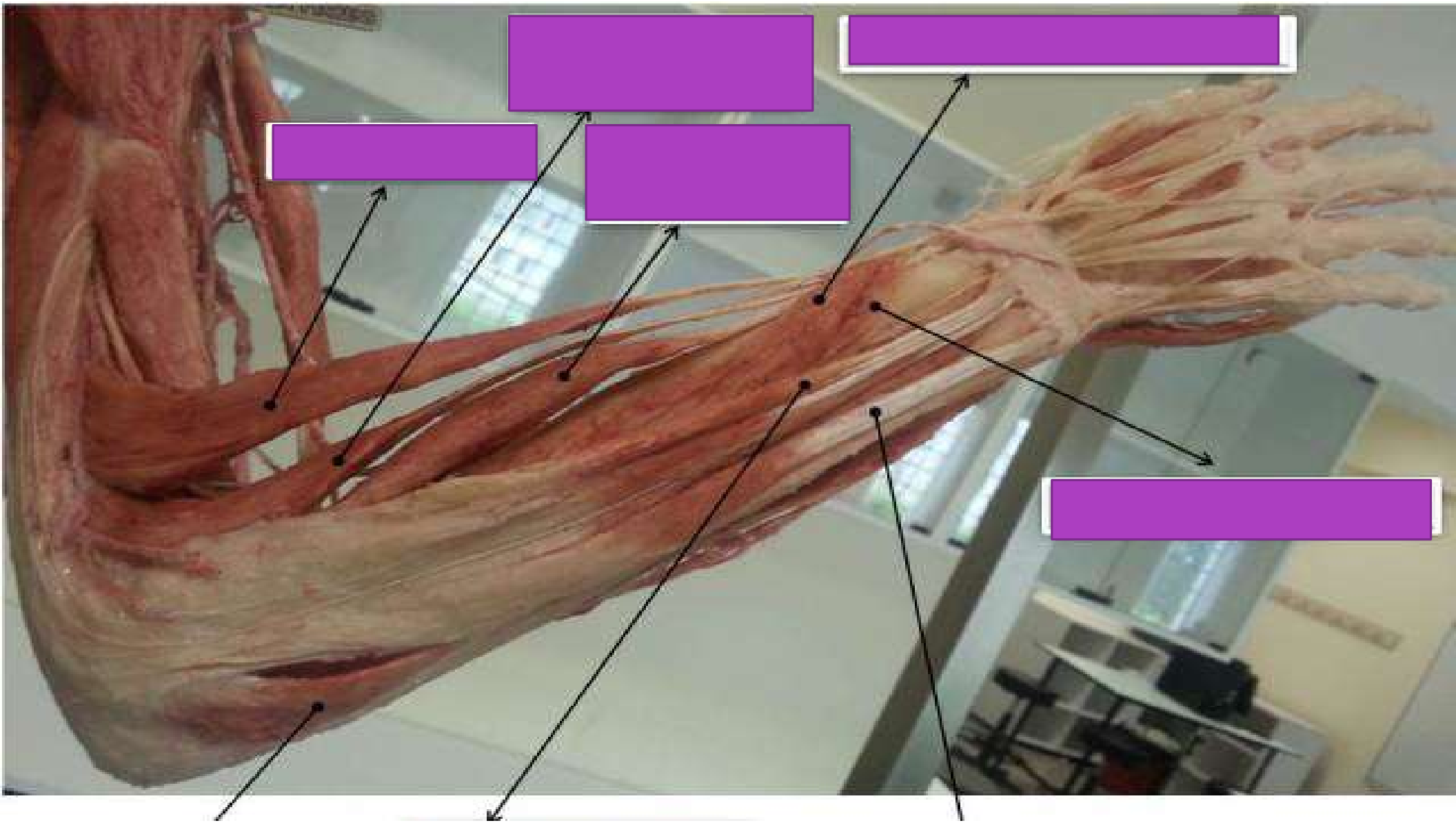


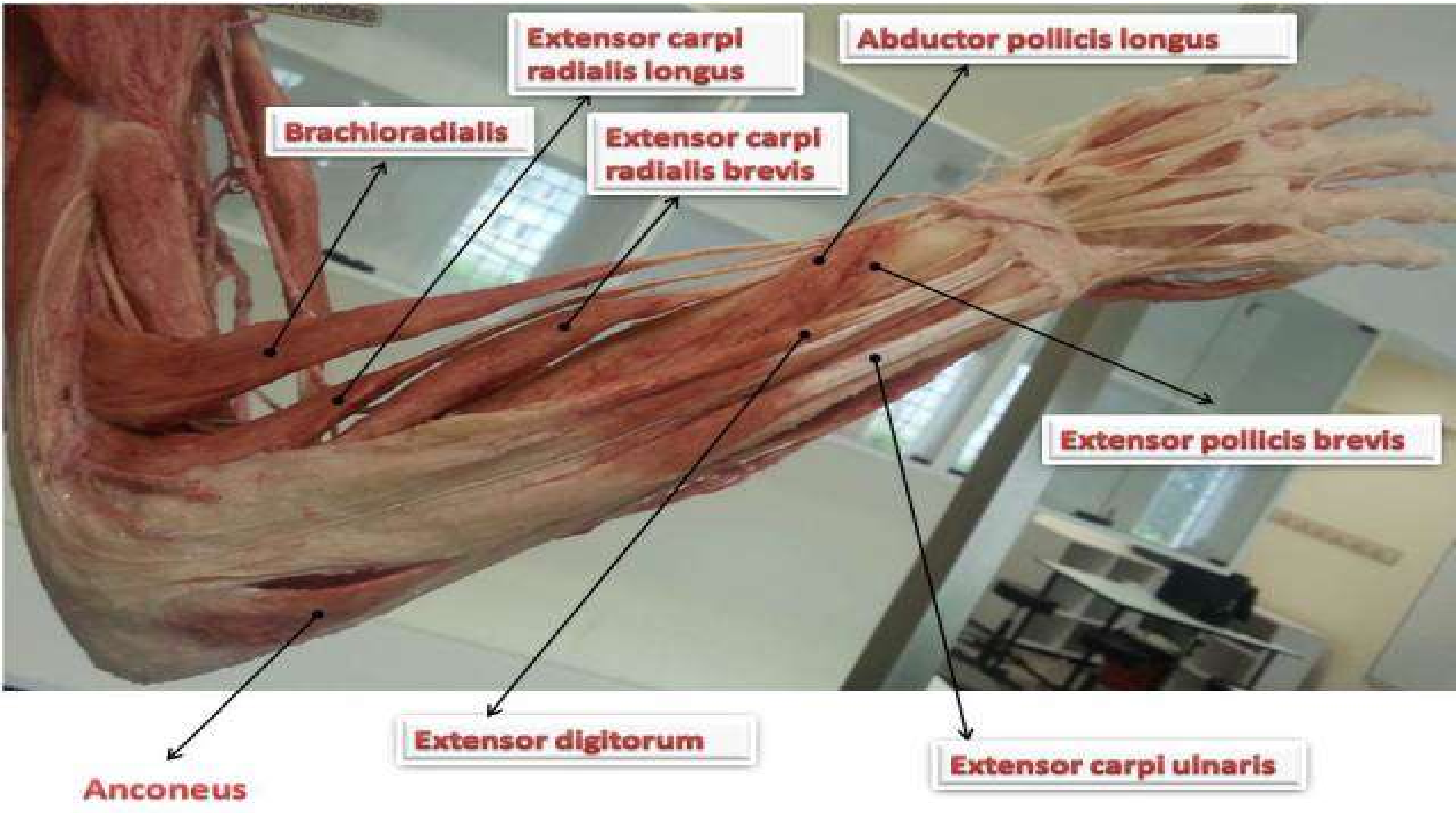
1. Abductor pollicis longus
2. Extensor pollicis longus

POSTERIOR LEFT ARM

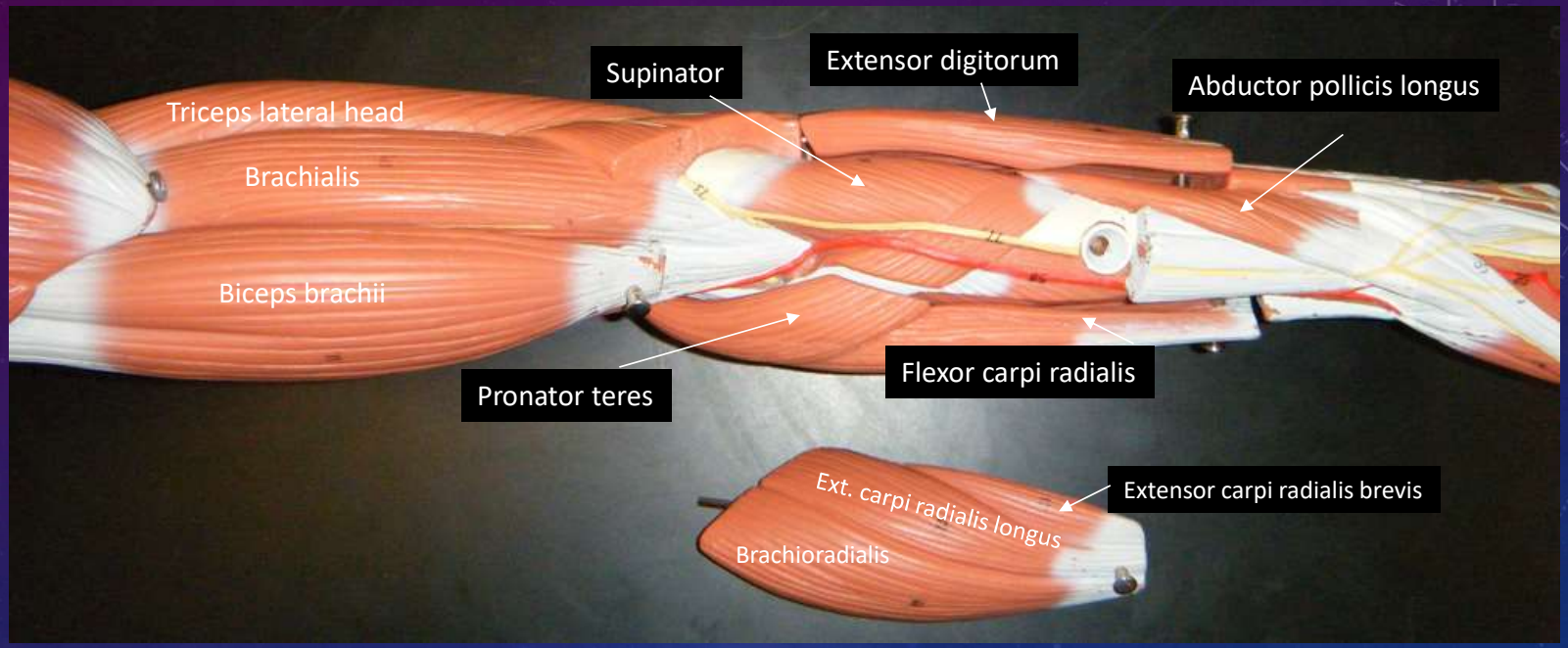


1. Abductor pollicis longus
2. Extensor pollicis longus

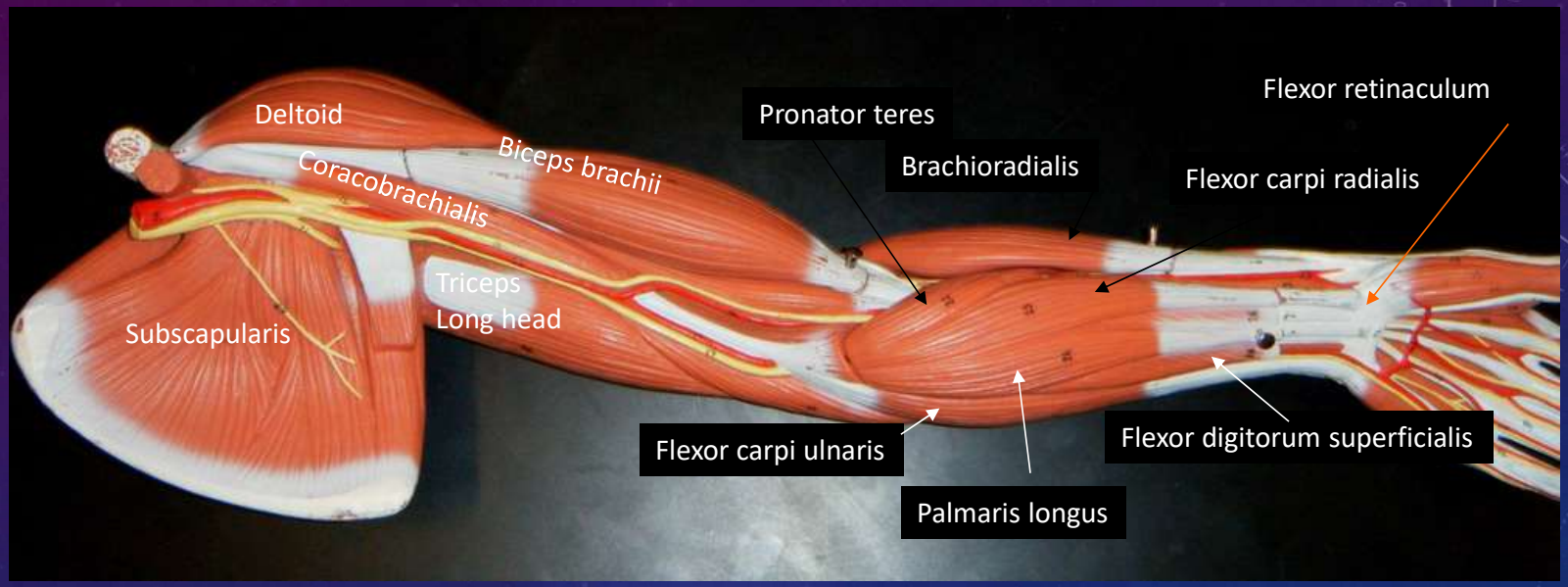



Extensor carpi radialis longus
Abductor pollicis longus
Brachioradialis
Extensor carpi radialis brevis
Extensor pollicis brevis
Extensor digitorum
Extensor carpi ulnaris
Anconeus

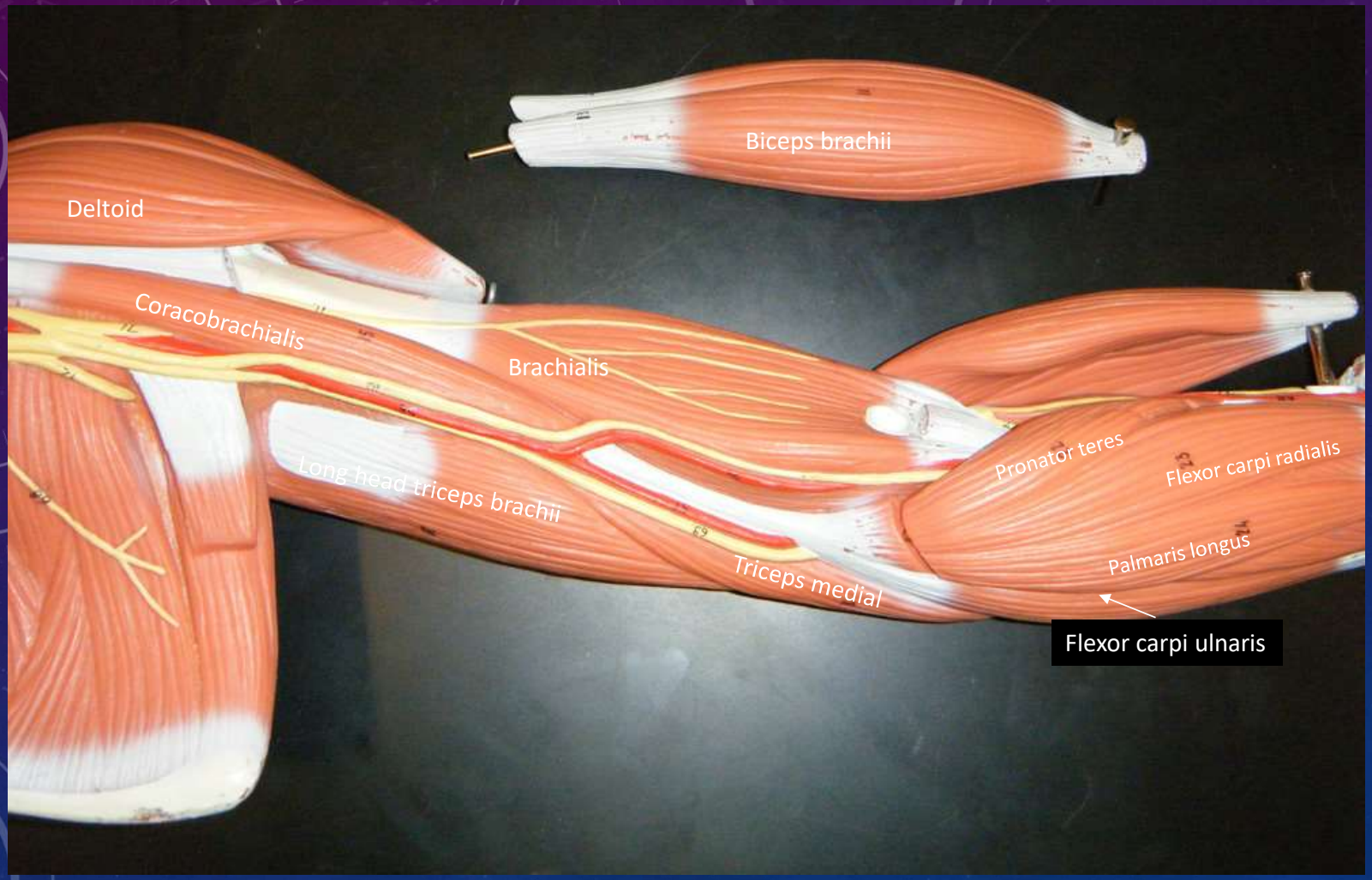
POSTERIOR LEFT ARM - SUPERFICIAL LOWER ARM MUSCLES REMOVED

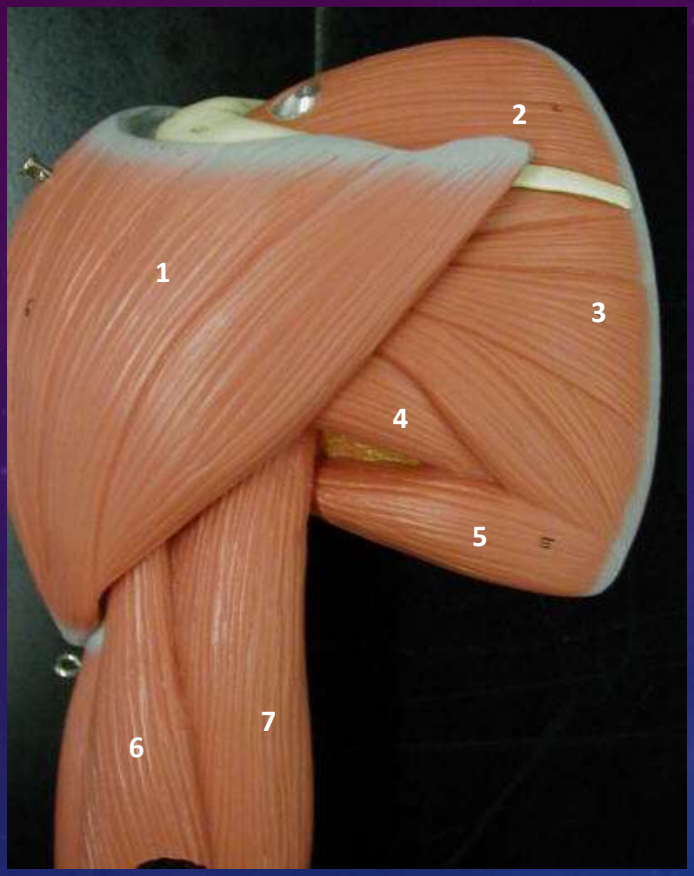


LEFT ARM ANTERIOR

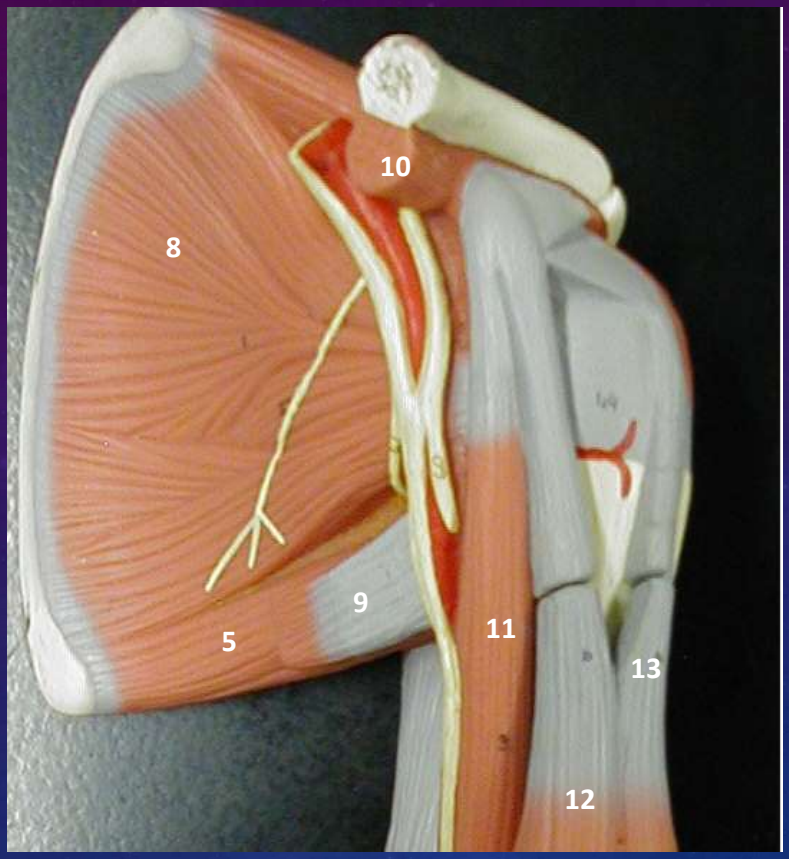


ANTERIOR LEFT UPPER ARM - BICEPS REMOVED

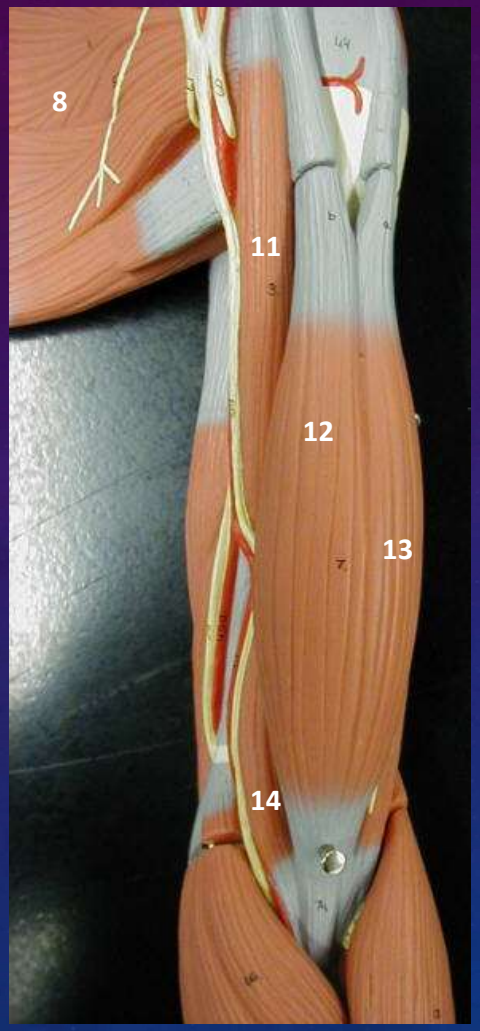




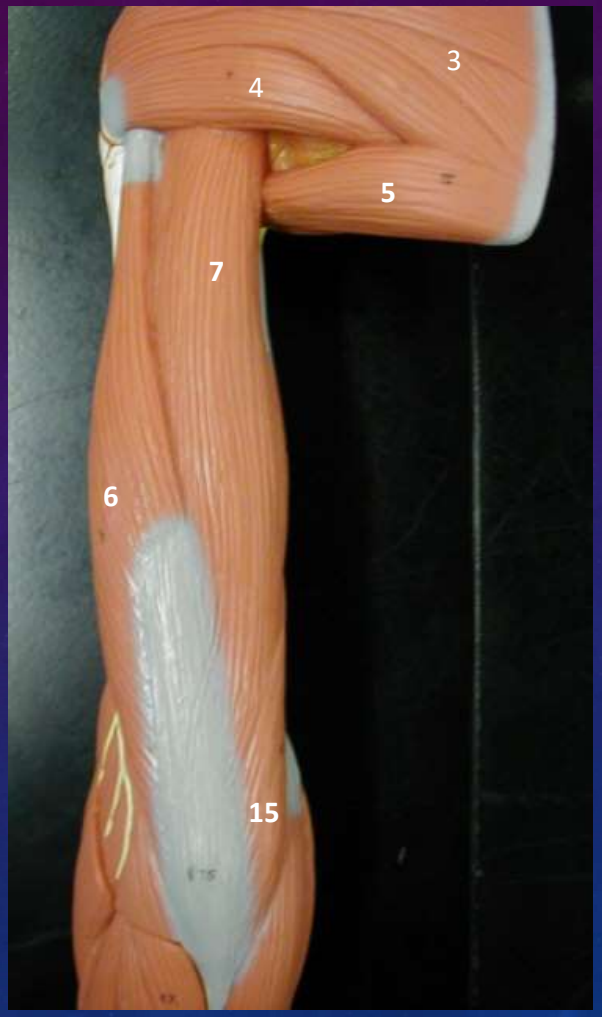
1. Deltoid
2. Supraspinatus
3. Infraspinatus
4. Teres minor
5. Teres major
6. Lateral head triceps brachii
7. Long head triceps brachii



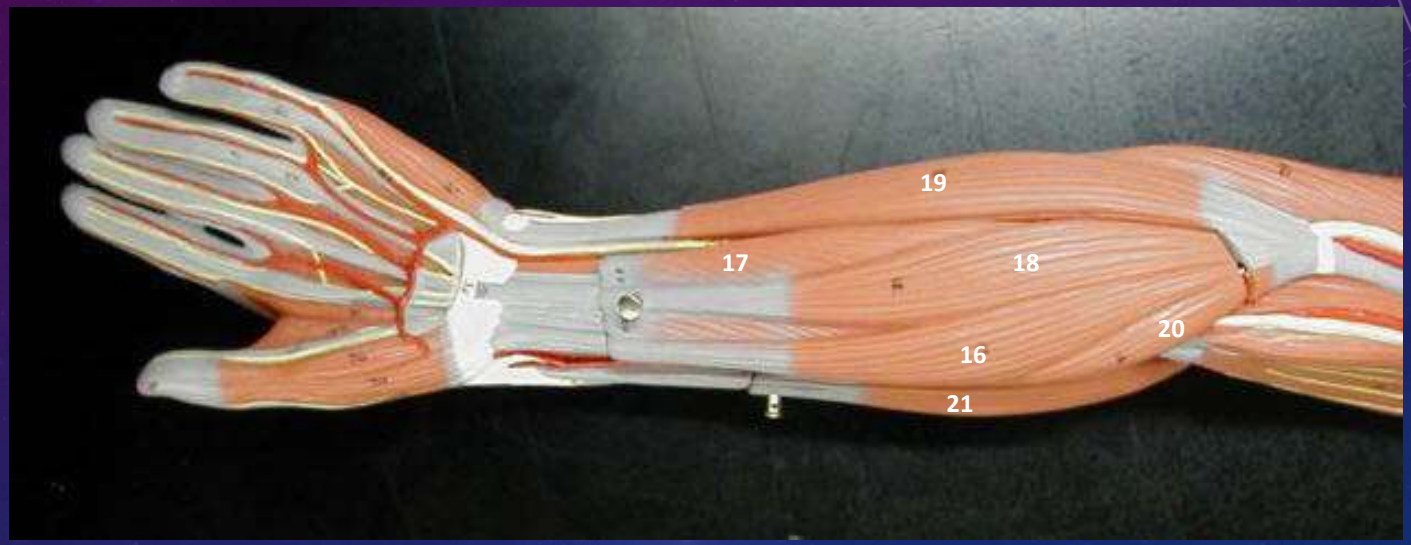
5. Teres major
8. Subscapularis
9. Latissimus dorsi
10. Subclavius
11. Coracobrachialis
12. Short head biceps brachii
13. Long head biceps brachii



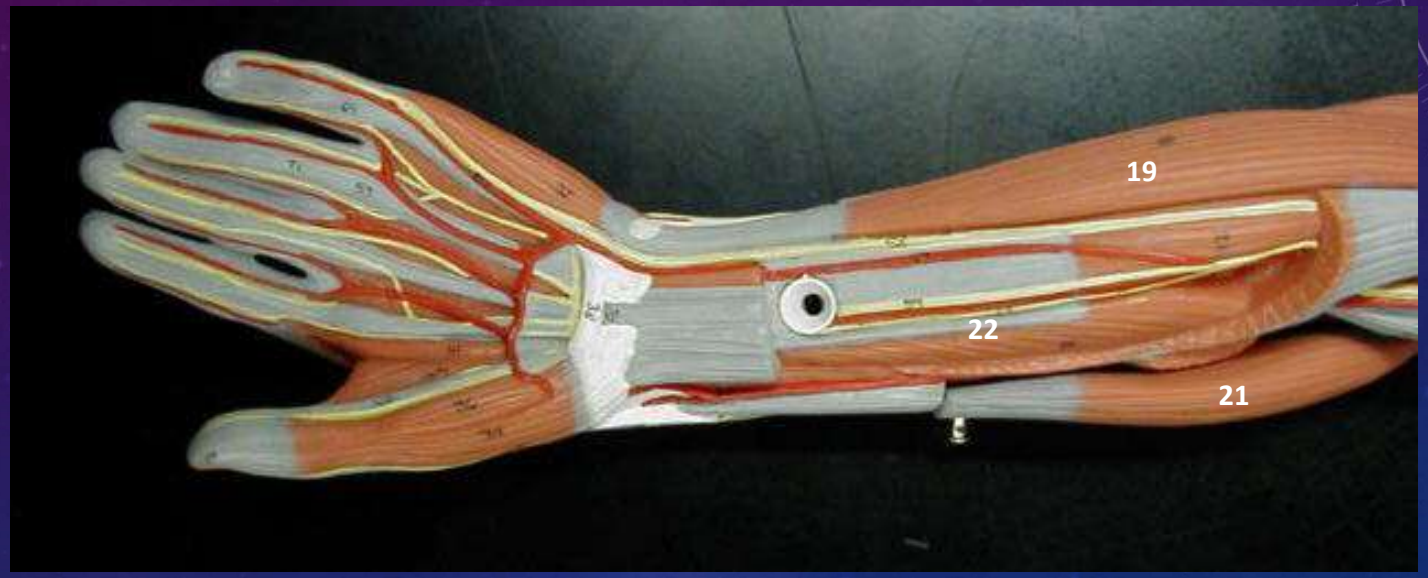
8. Subscapularis
11. Coracobrachialis
12. Short head biceps brachii
13. Long head biceps brachii
14. Brachialis



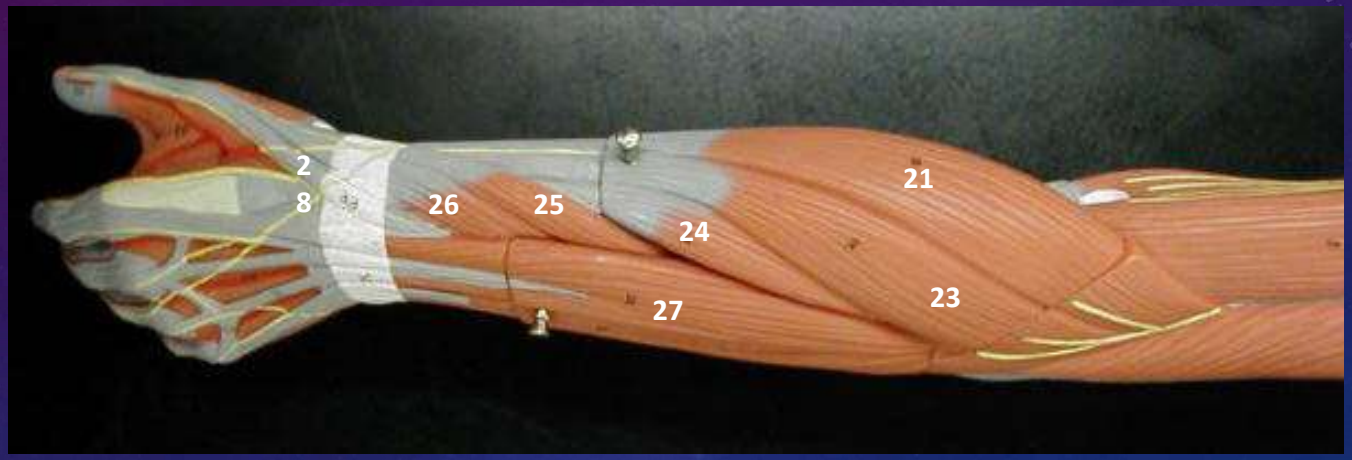
3. Infraspinatus
4. Teres minor
5. Teres Major
6. Lateral head triceps brachii
7. Long head triceps brachii
15. Medial head triceps brachii



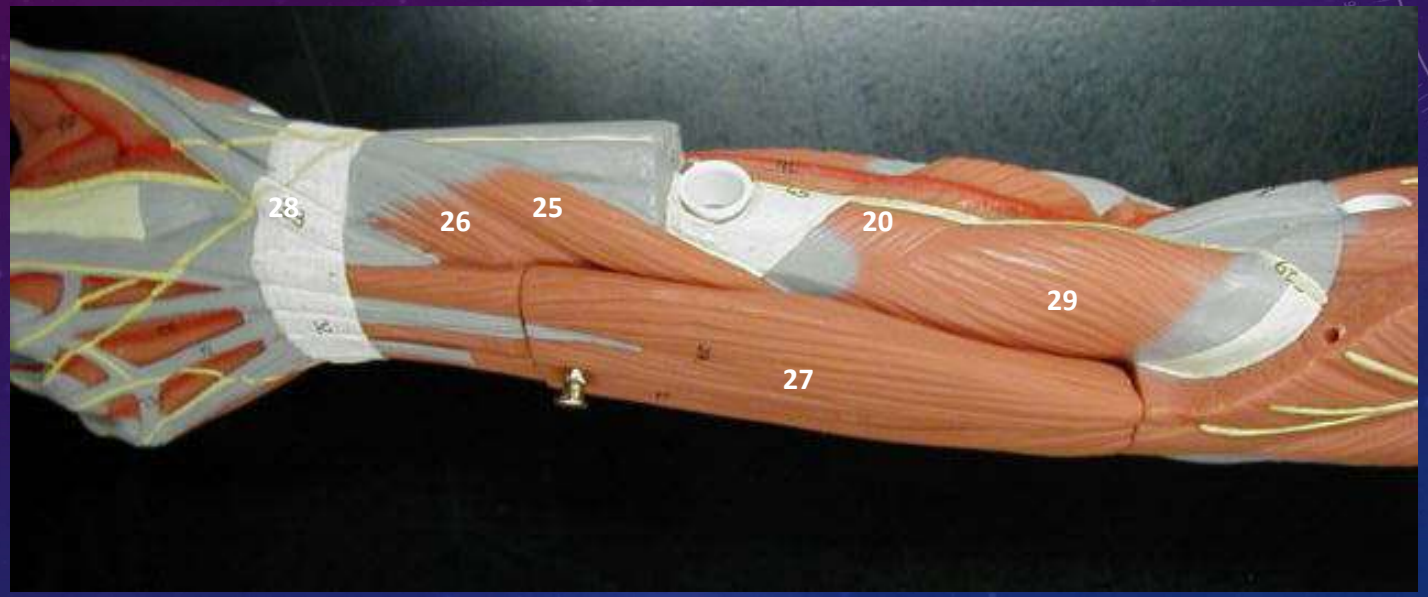
16. Flexor carpi radialis
17. Flexor digitorum superficialis
18. Palmaris longus
19. Flexor carpi ulnaris
20. Pronator teres
21. Brachioradialis



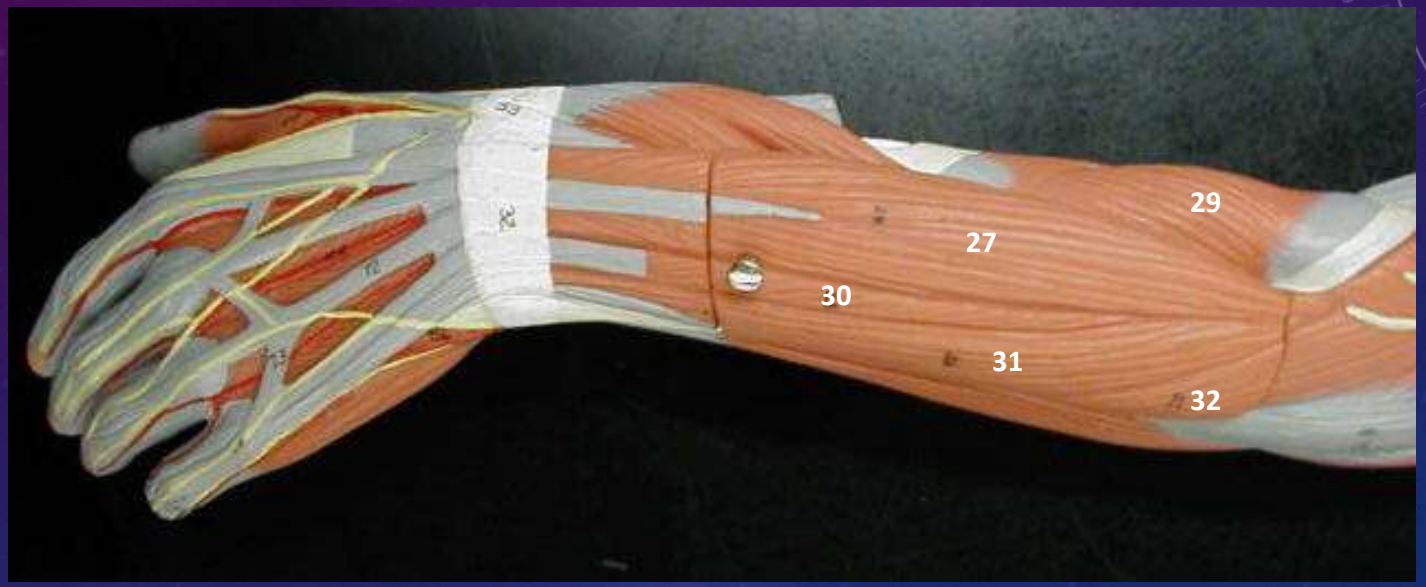
19. Flexor carpi ulnaris
21. Brachioradialis
22. Flexor digitorum profundus



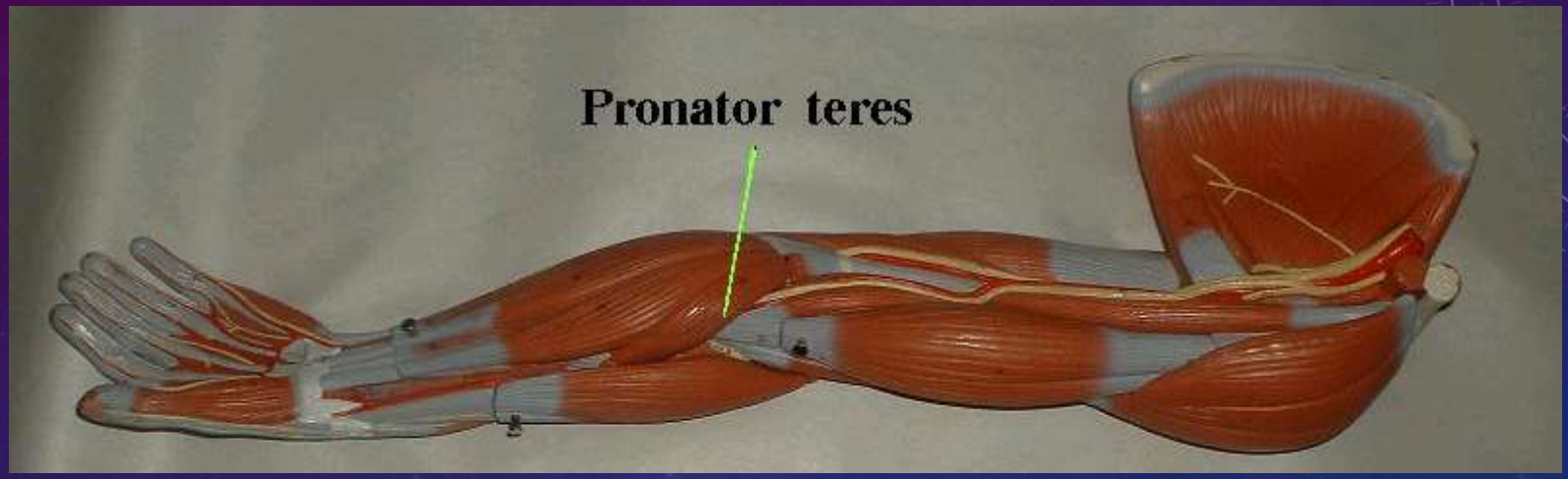
21. Brachioradialis
23. Extensor carpi radialis longus
24. Extensor carpi radialis brevis
25. Abductor pollicis longus
26. Extensor pollicis brevis
27. Extensor digitorum
28. Extensor pollicis longus tendon

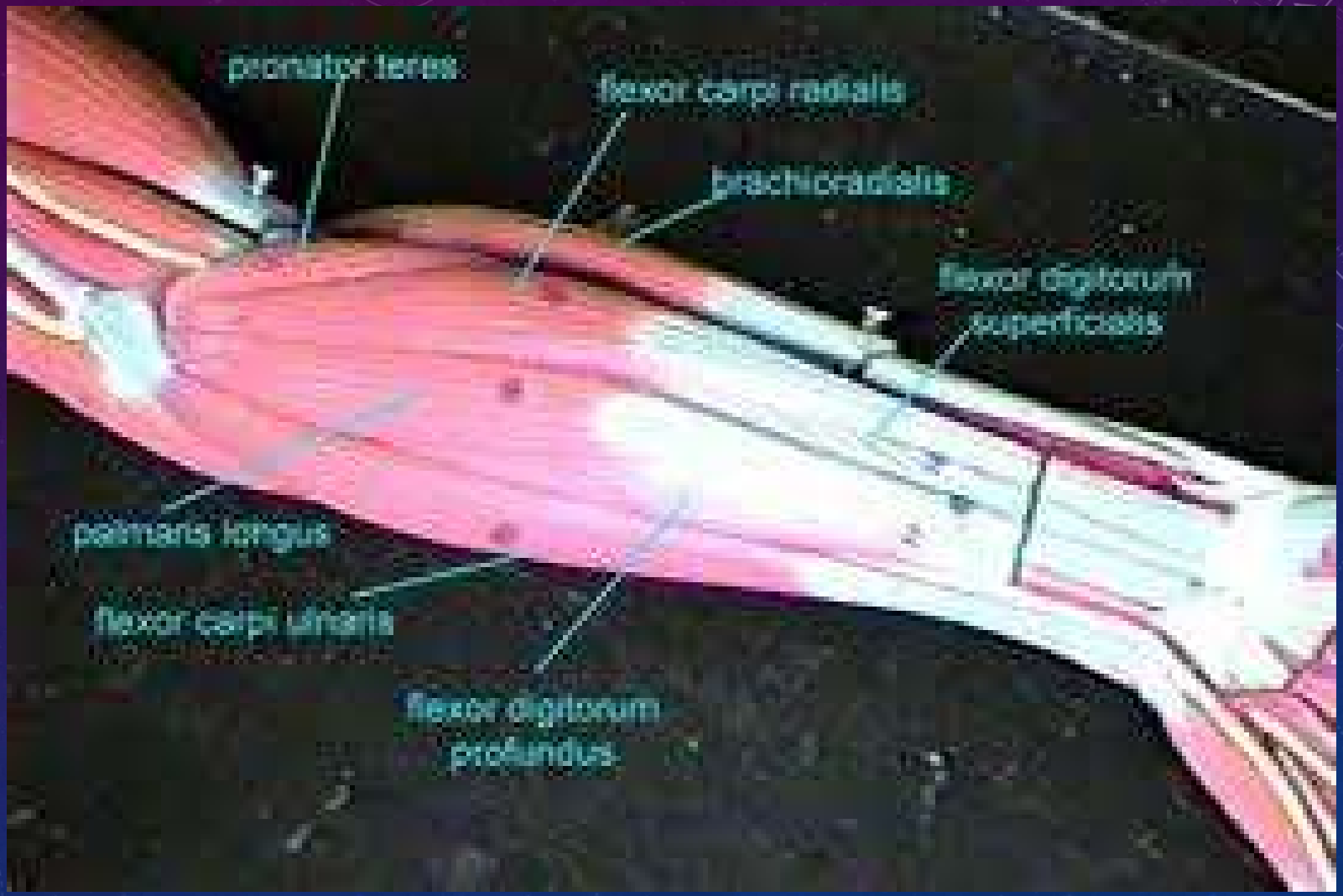


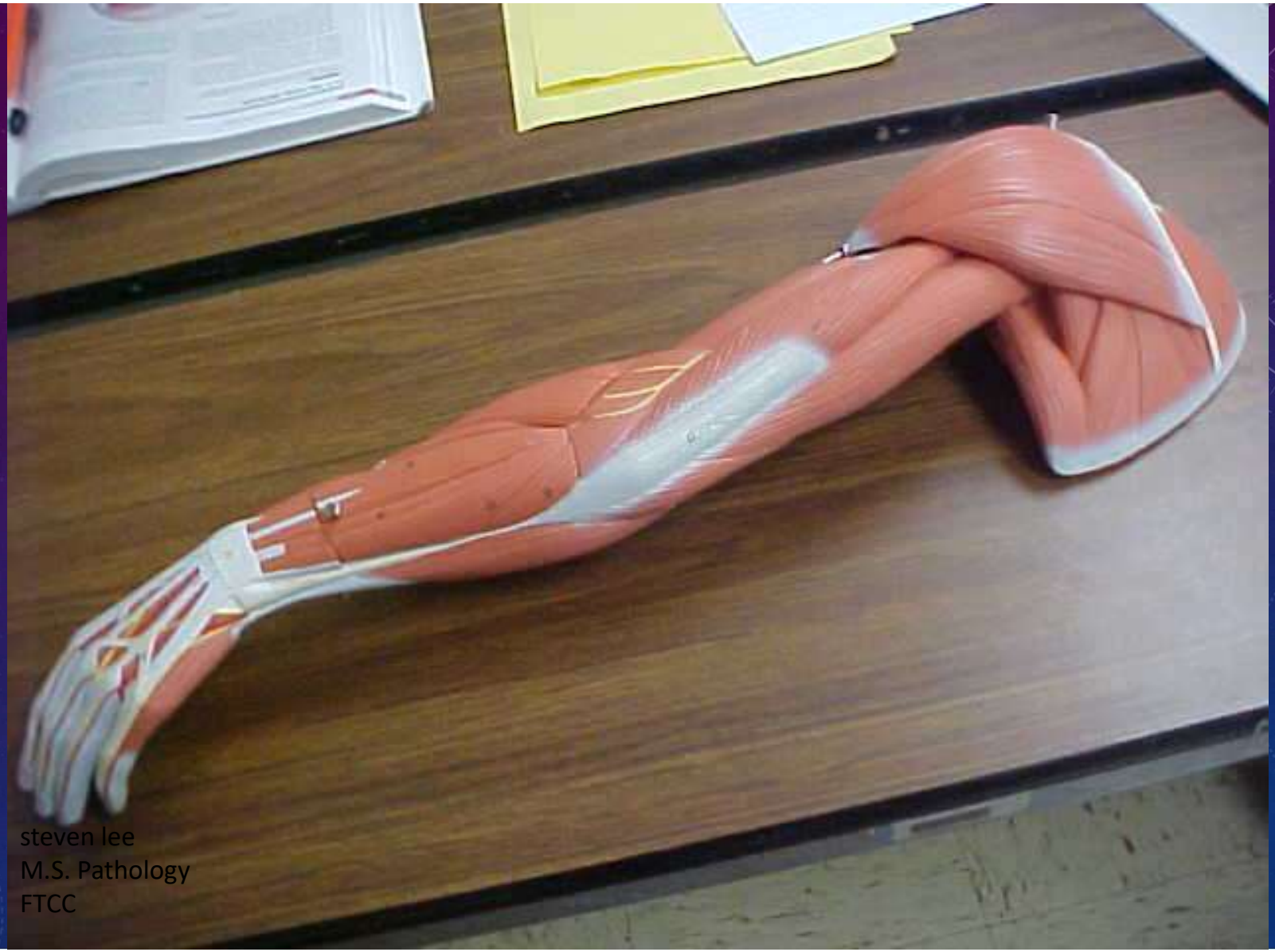
20. Pronator teres
25. Abductor pollicis longus
26. Extensor pollicis brevis
27. Extensor digitorum
28. Extensor pollicus longus tendon
29. Supinator

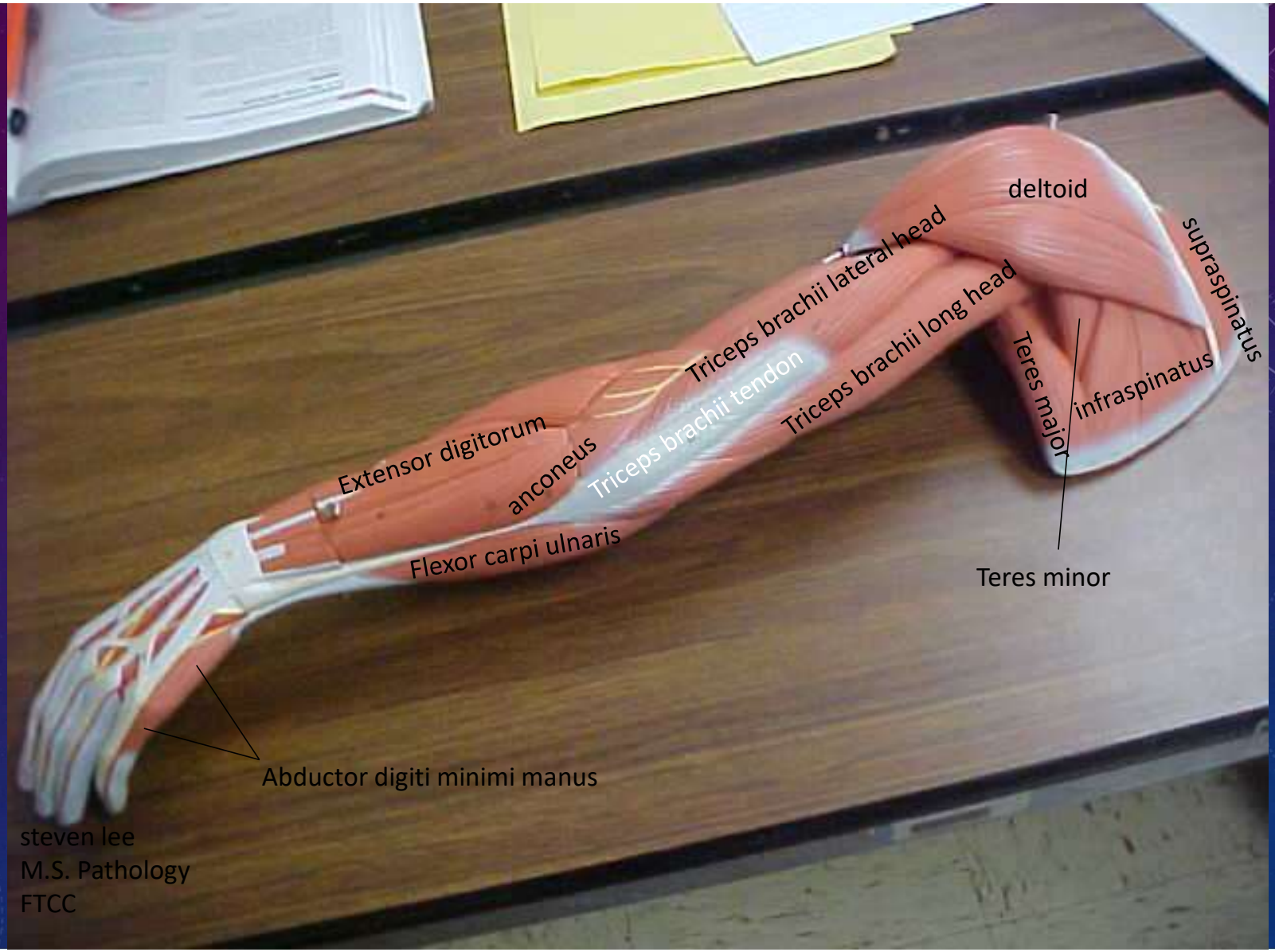


27. Extensor digitorum
29. Supinator
30. Extensor digiti minimi
31. Extensor carpi ulnaris
32. Anconeus

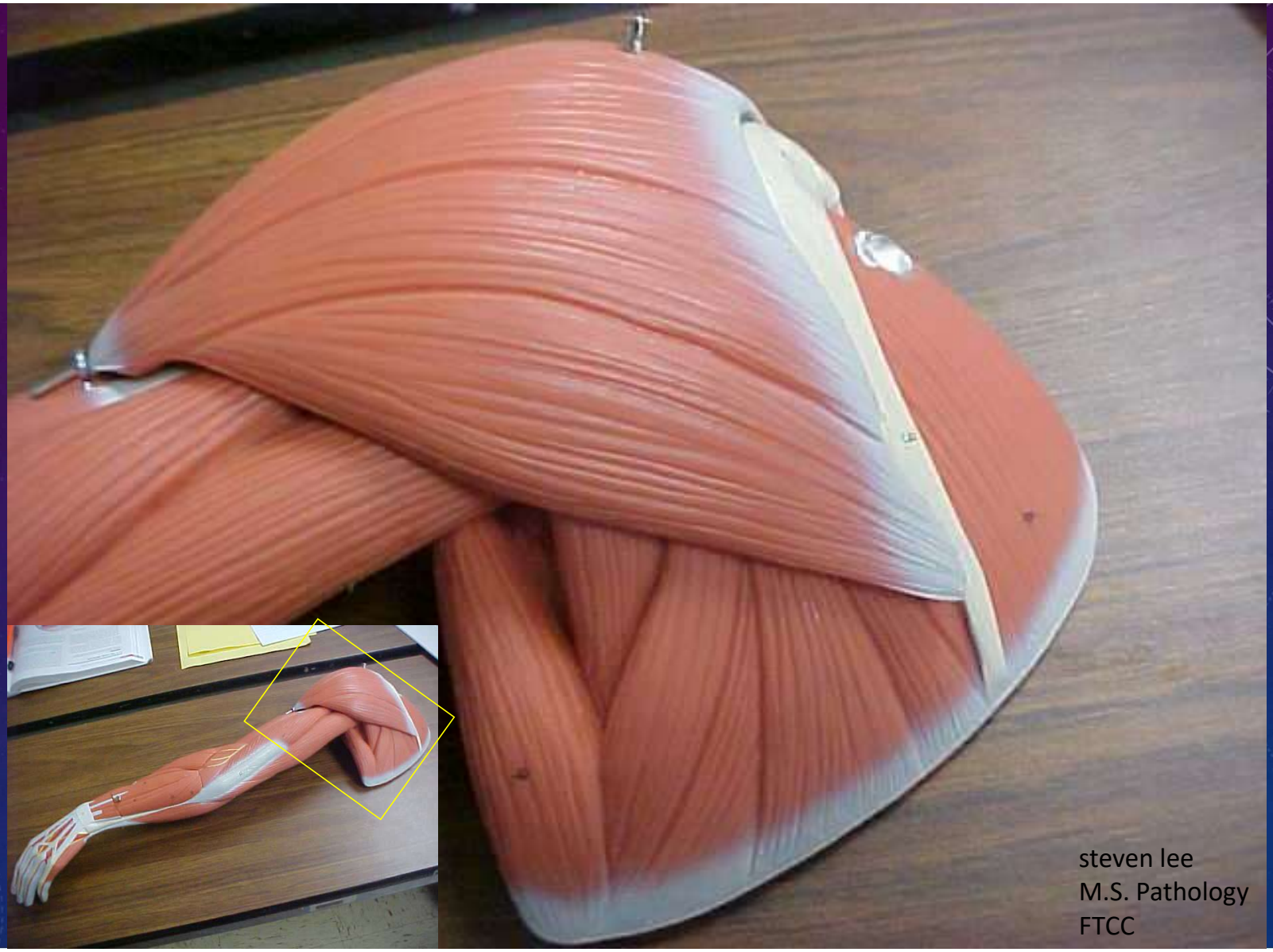

Pronator teres


pronator teres
flexor carpi radialis
brachioradialis
flexor digitorum superficialis
palmaris longus
flexor carpi ulnaris
flexor digitorum profundus

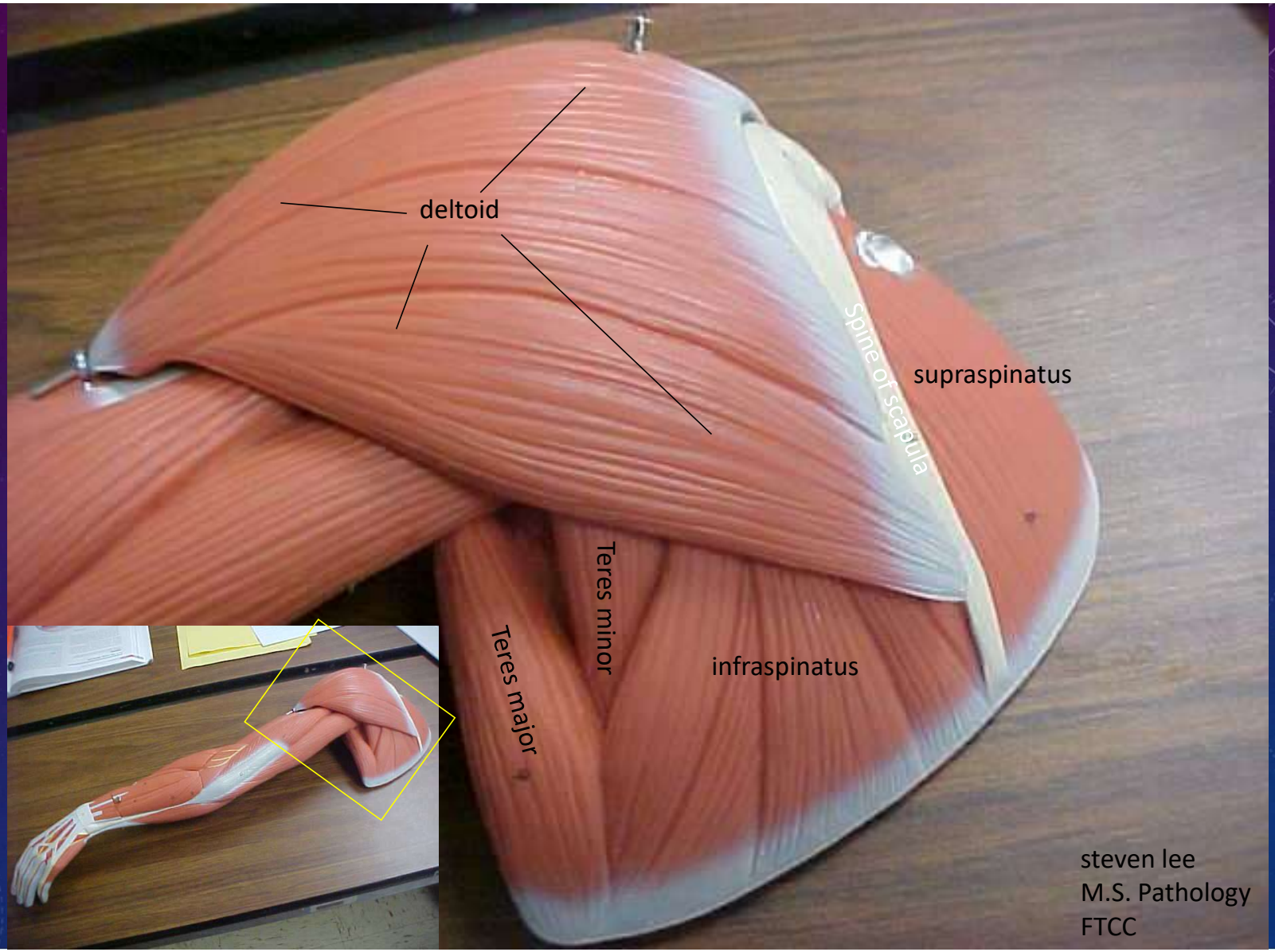

steven lee
M.S. Pathology
FTCC



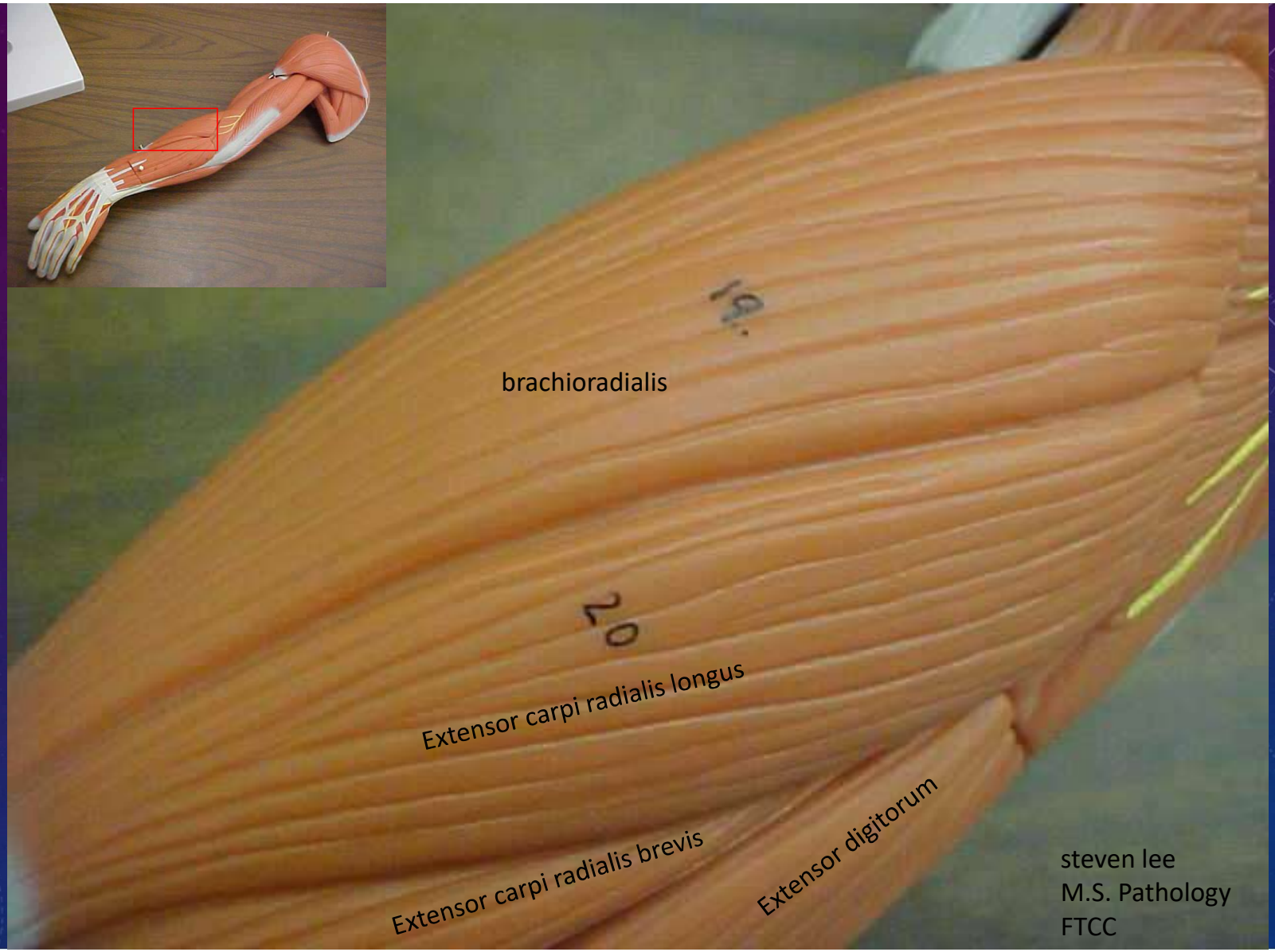
steven lee
M.S. Pathology
FTCC

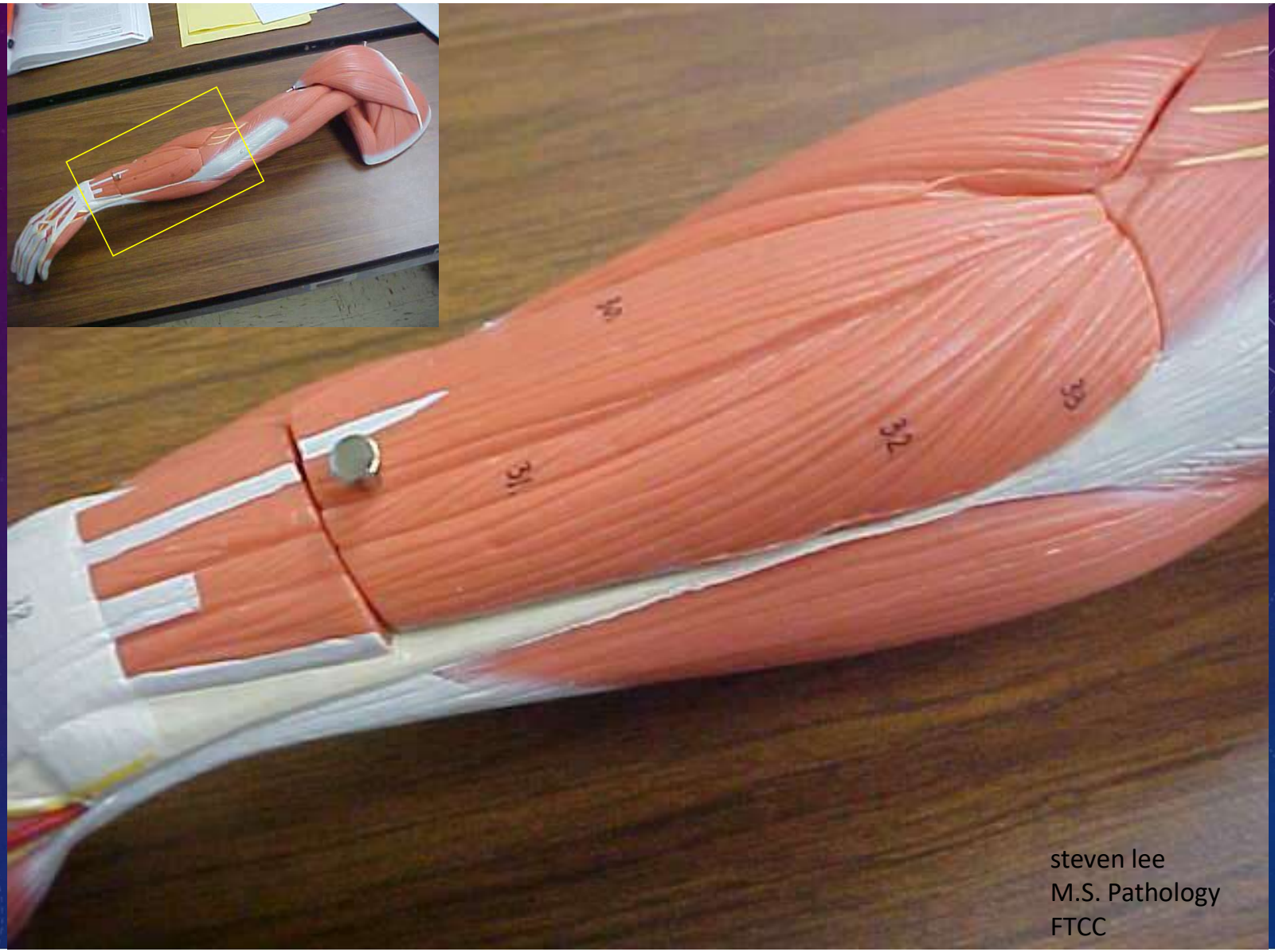


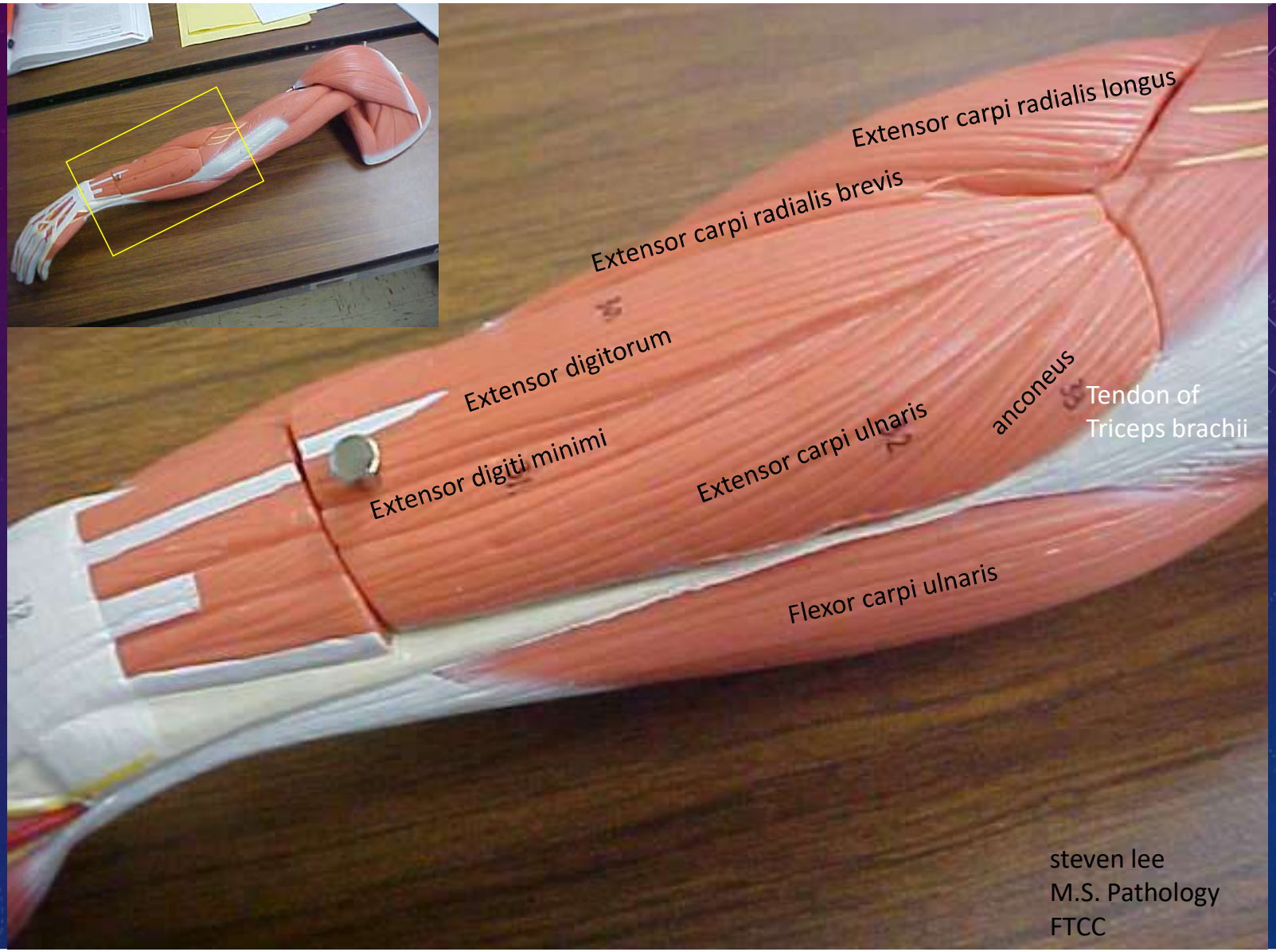
steven lee
M.S. Pathology
FTCC


deltoid
supraspinatus
Spine of scapula
Teres minor
Teres major
infraspinatus
steven lee
M.S. Pathology
FTCC

steven lee
M.S. Pathology
FTCC

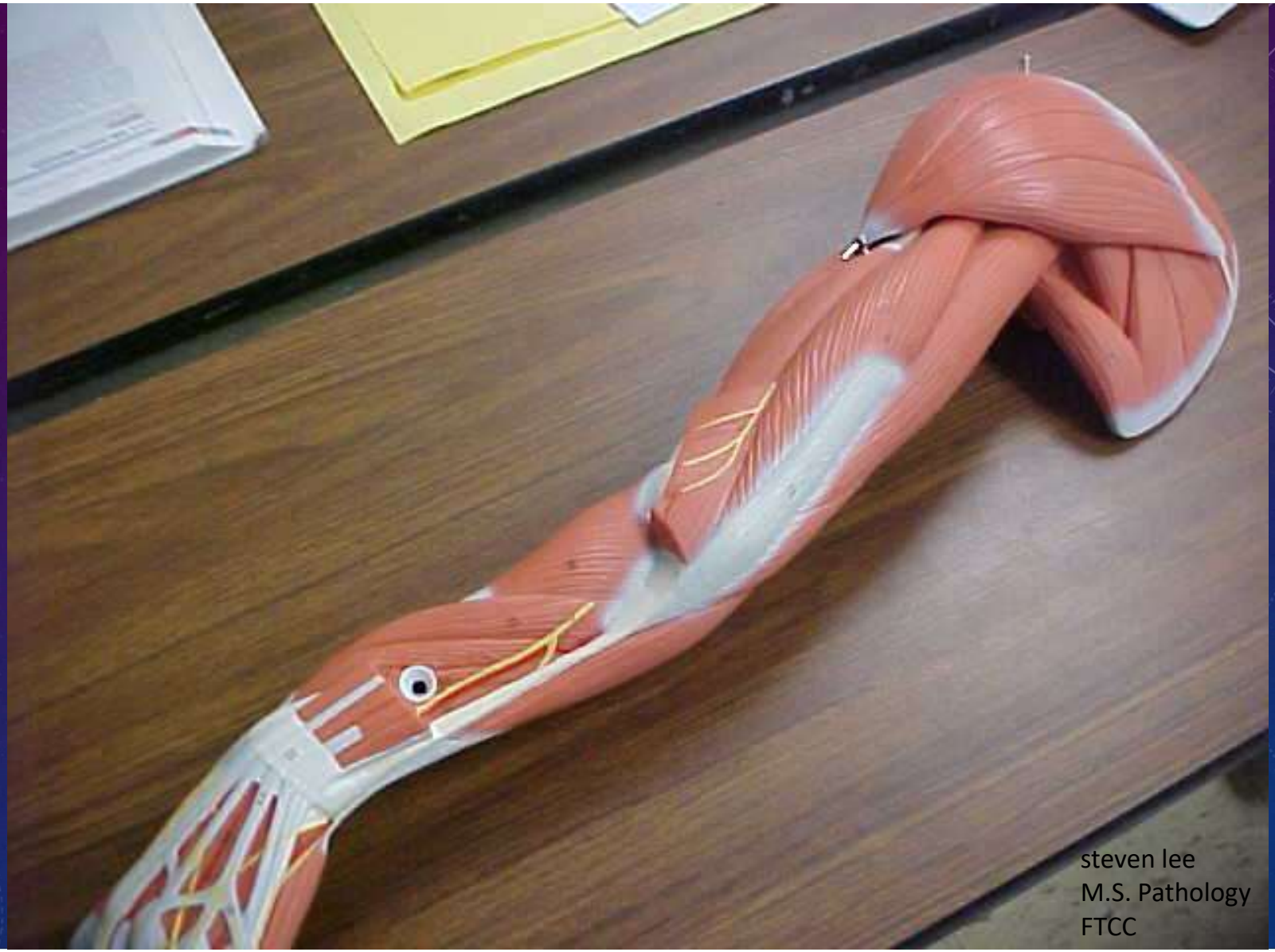

brachioradialis
Extensor carpi radialis longus
Extensor carpi radialis brevis
Extensor digitorum
steven lee
M.S. Pathology
FTCC

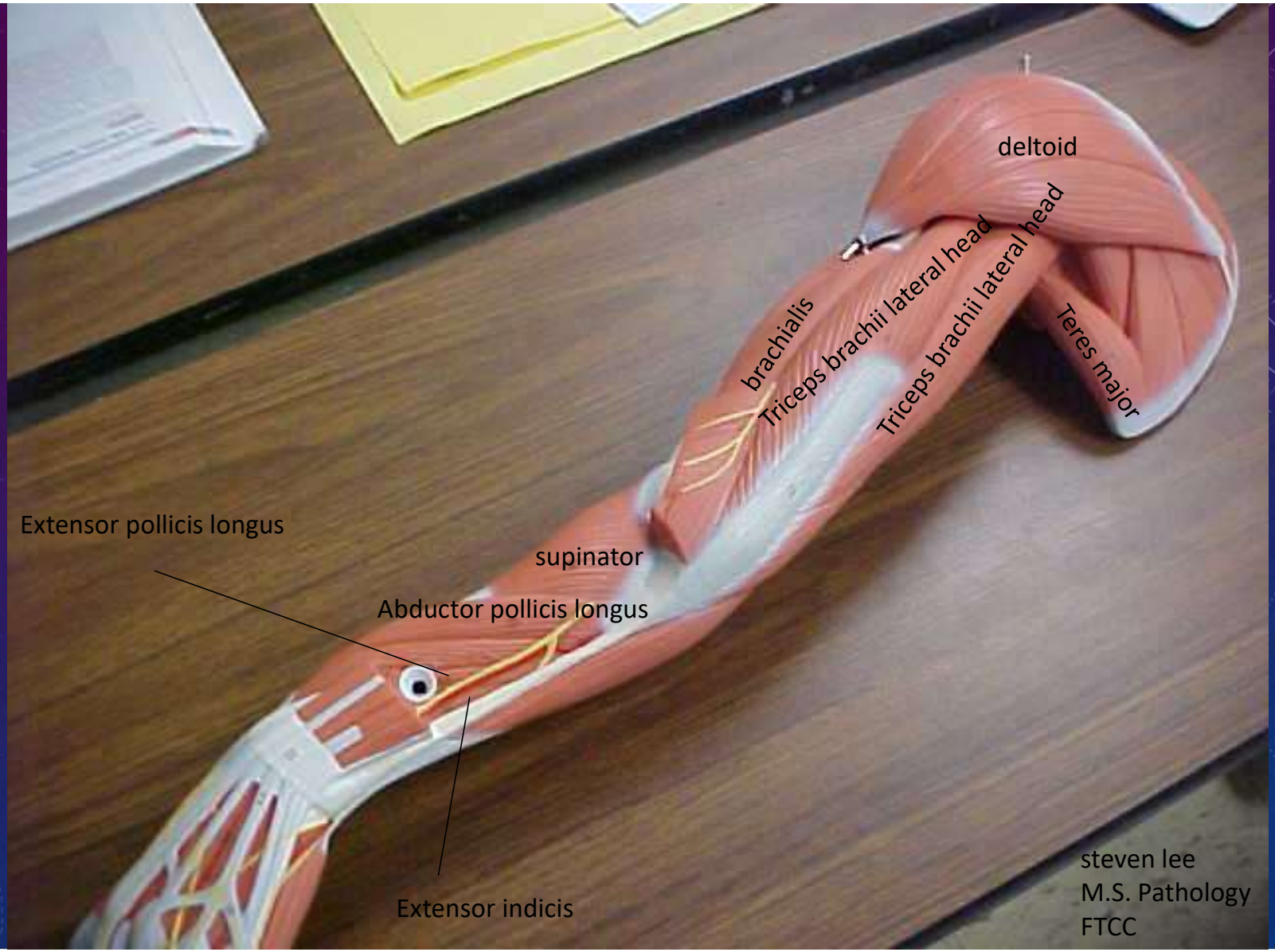

steven lee
M.S. Pathology
FTCC

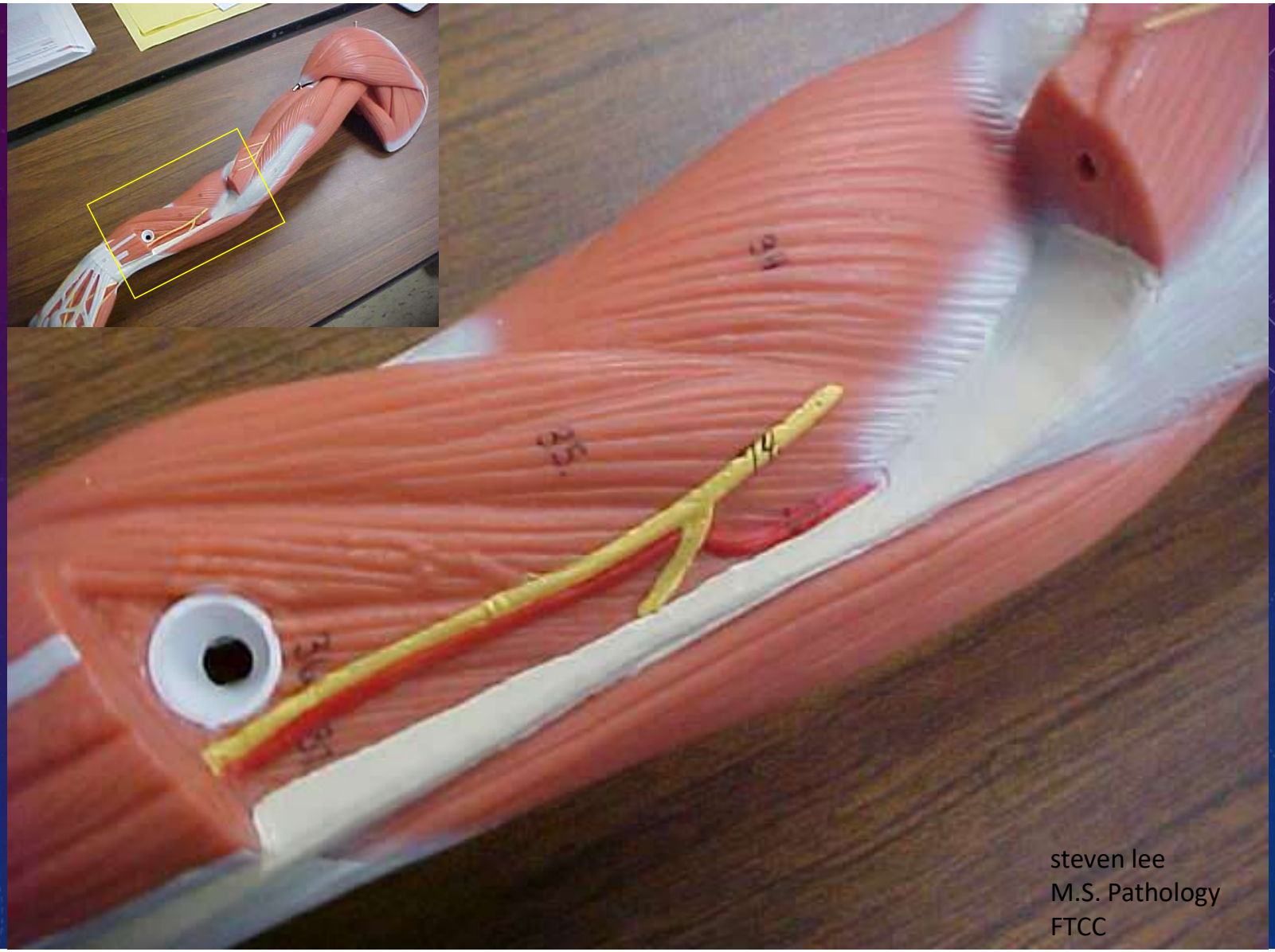

Extensor carpi radialis longus
Extensor carpi radialis brevis
Extensor digitorum
Extensor digiti minimi
Extensor carpi ulnaris
anconeus
Tendon of
Triceps brachii
Flexor carpi ulnaris
steven lee
M.S. Pathology
FTCC

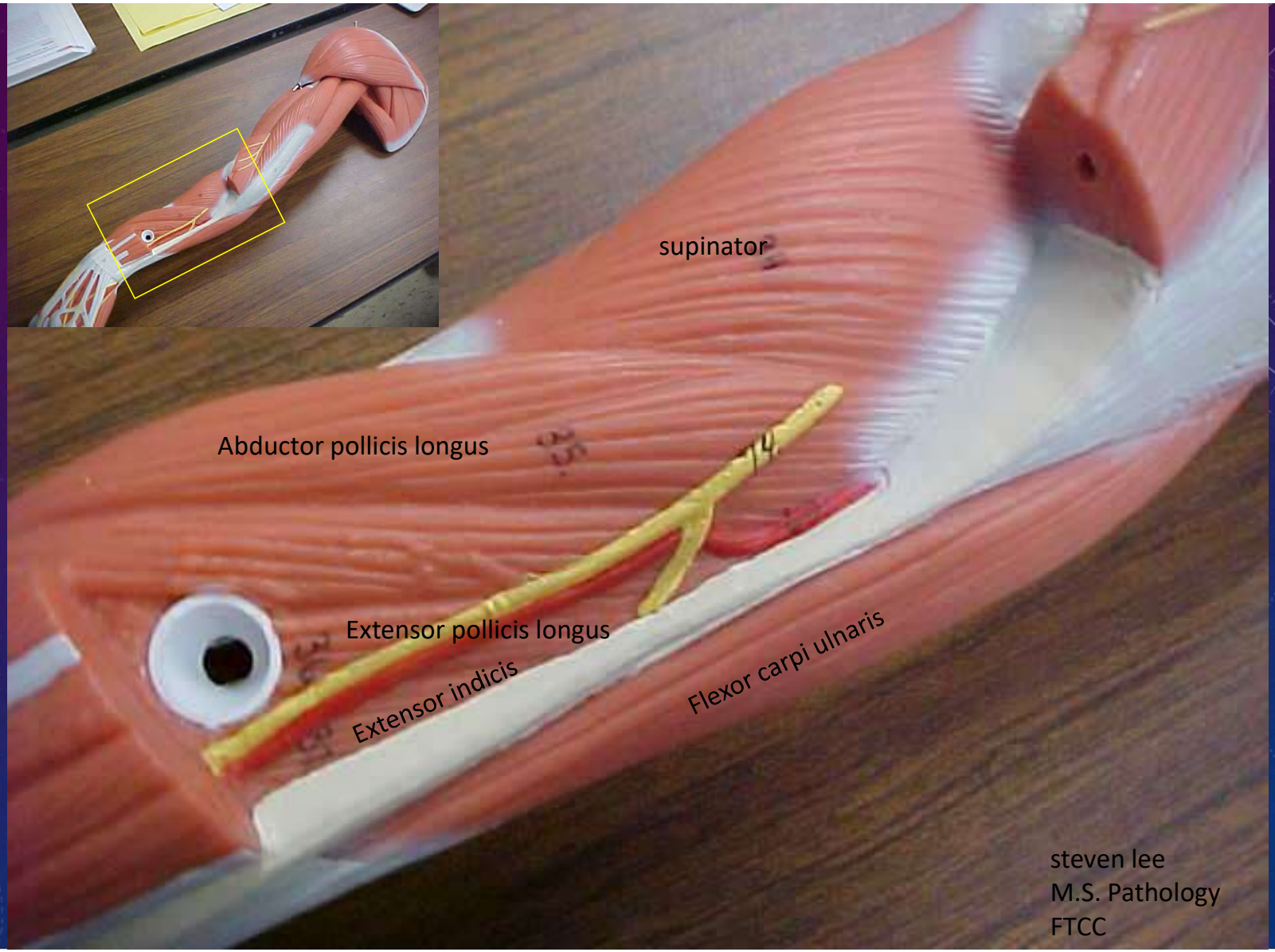
steven lee
M.S. Pathology
FTCC

steven lee
M.S. Pathology
FTCC

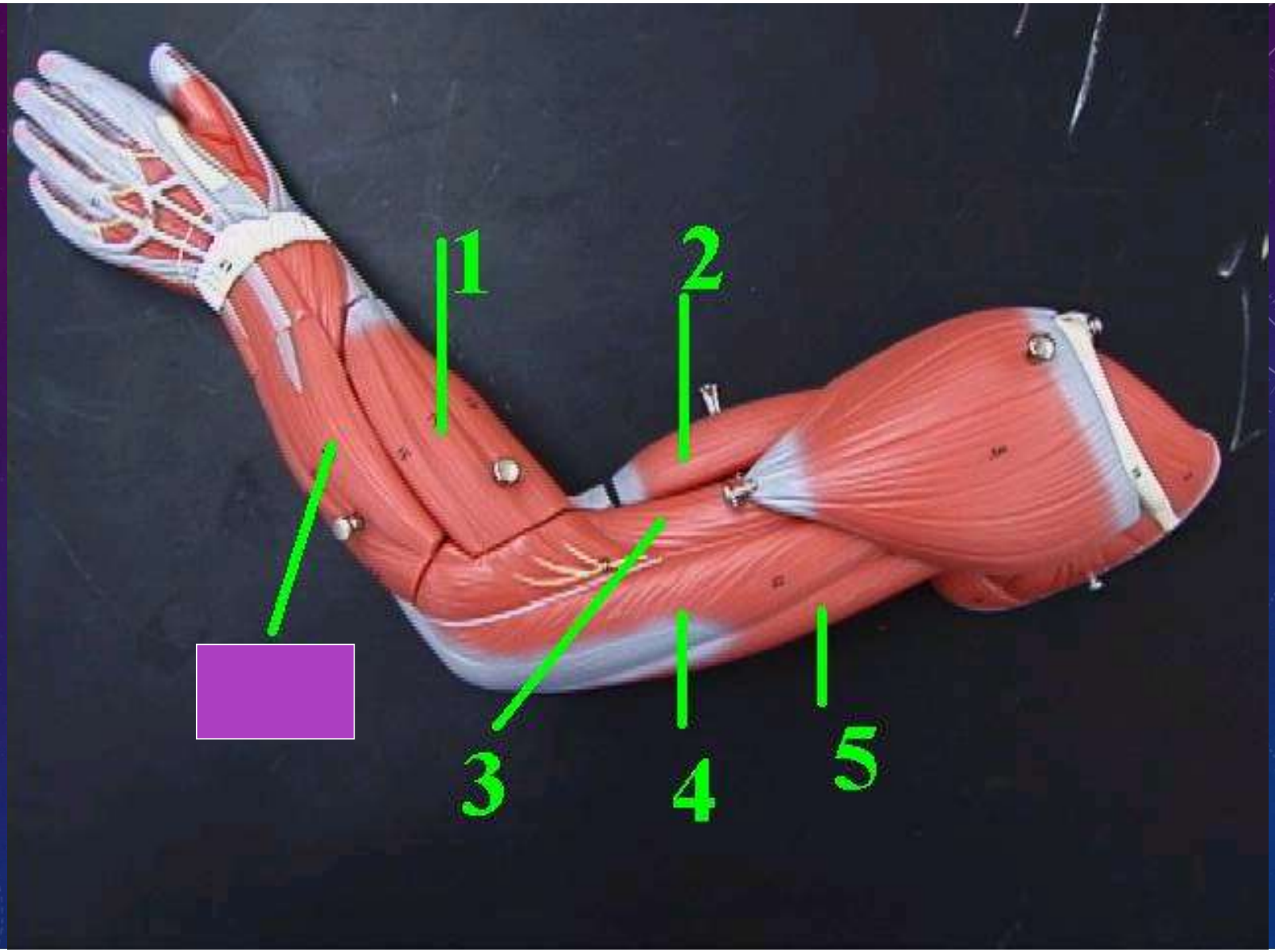

steven lee
M.S. Pathology
FTCC

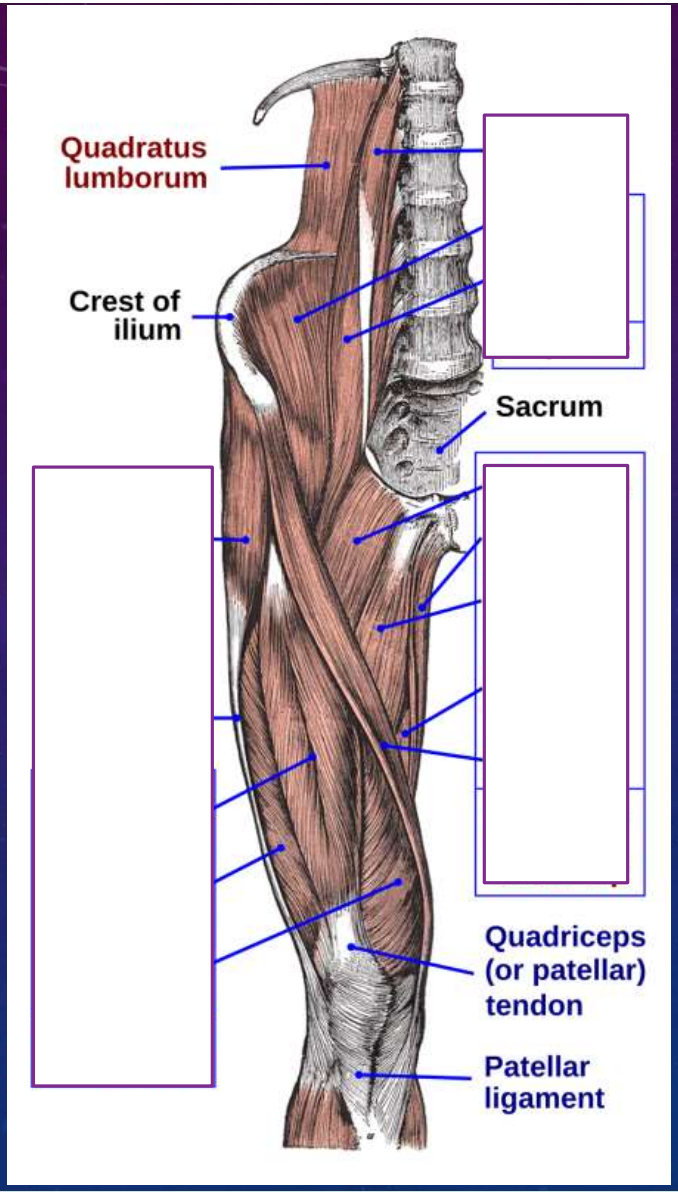

deltoid
brachialis
Triceps brachii lateral head
Triceps brachii lateral head
Teres major
Extensor pollicis longus
supinator
Abductor pollicis longus
Extensor indicis
steven lee
M.S. Pathology
FTCC

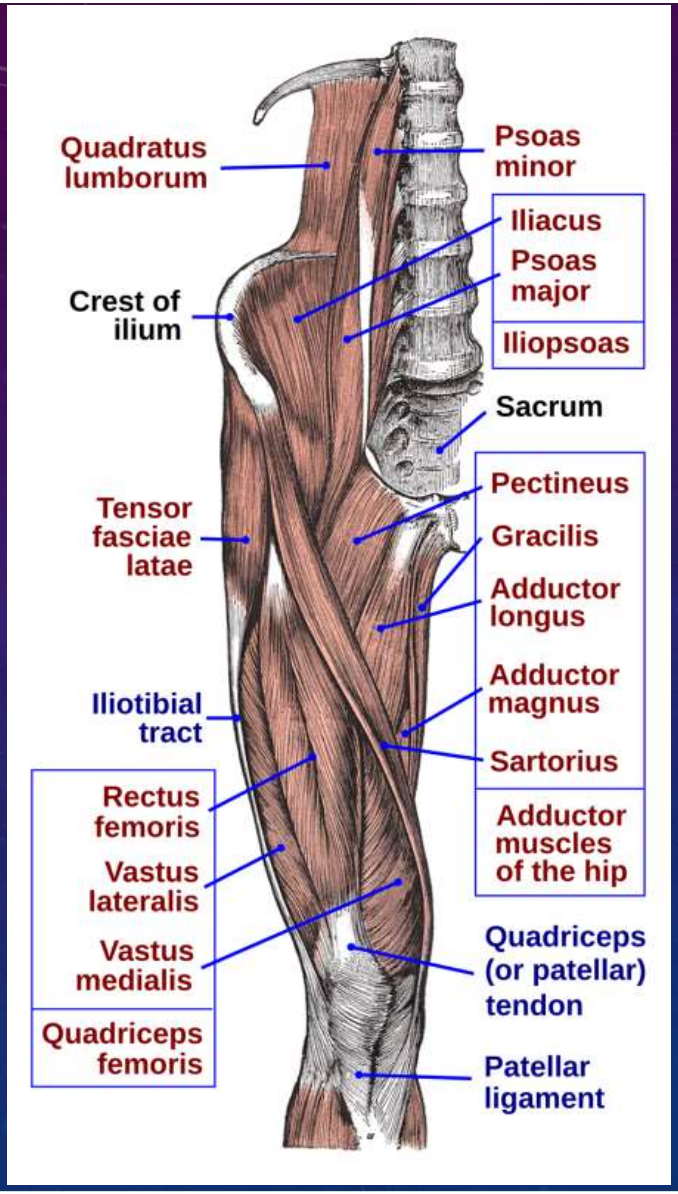

steven lee
M.S. Pathology
FTCC

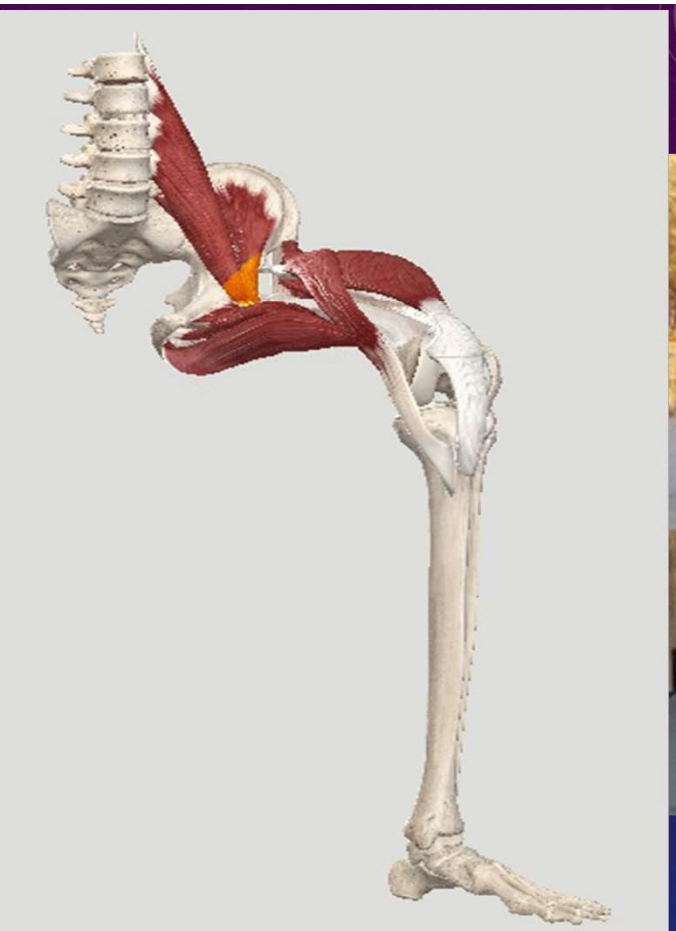


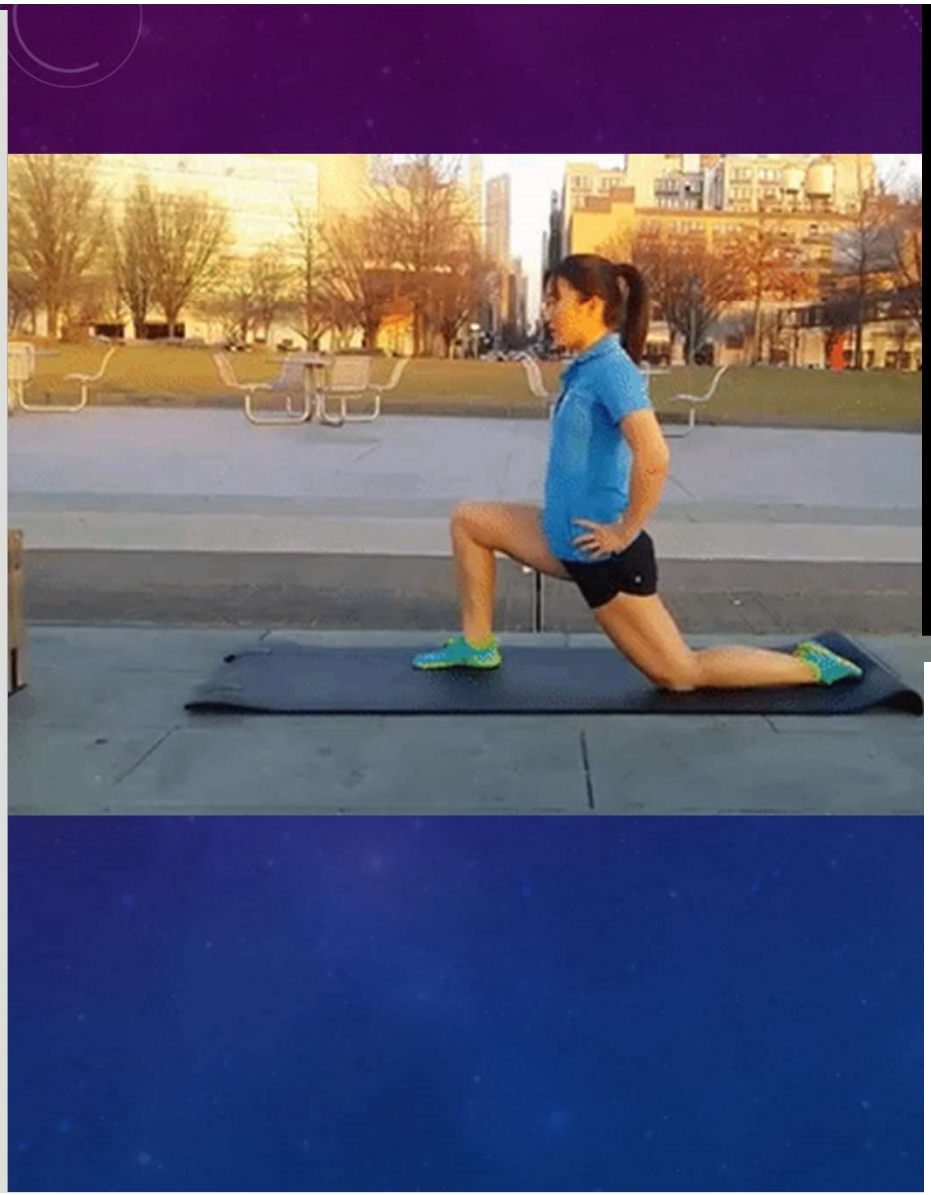
steven lee
M.S. Pathology
FTCC

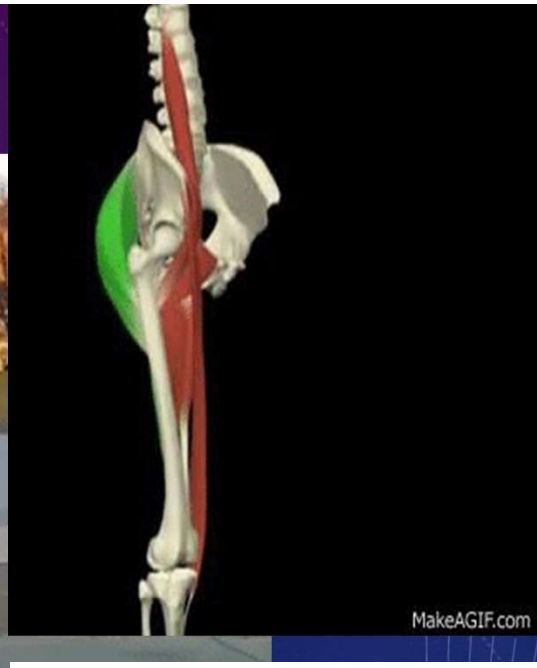

1
2
3
4
5

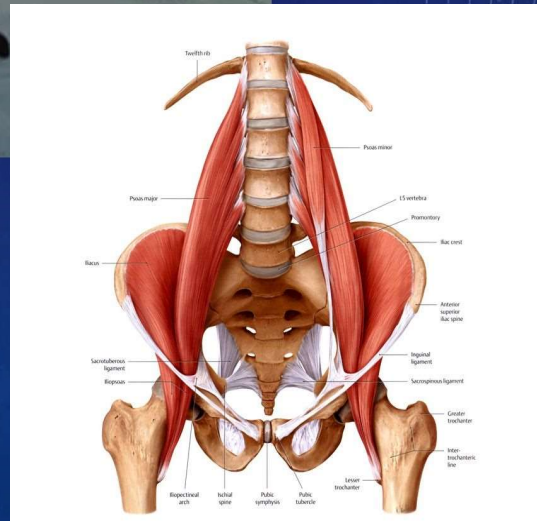

Quadratus lumborum
Crest of ilium
Sacrum
Quadriceps (or patellar) tendon
Patellar ligament

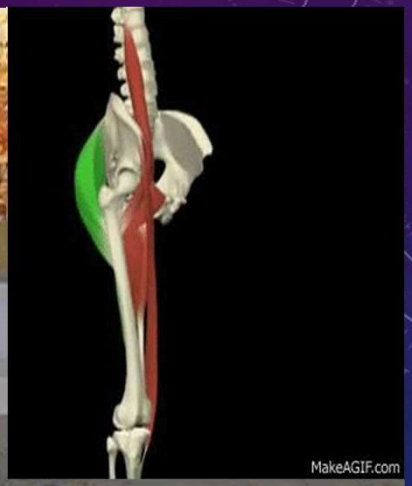

Quadratus lumborum
Psoas minor
Iliacus
Psoas major
Iliopsoas
Crest of ilium
Sacrum
Pectineus
Tensor fasciae latae
Gracilis
Adductor longus
Adductor magnus
Iliotibial tract
Sartorius
Adductor muscles of the hip
Rectus femoris
Vastus lateralis
Vastus medialis
Quadriceps femoris
Quadriceps (or patellar) tendon
Patellar ligament

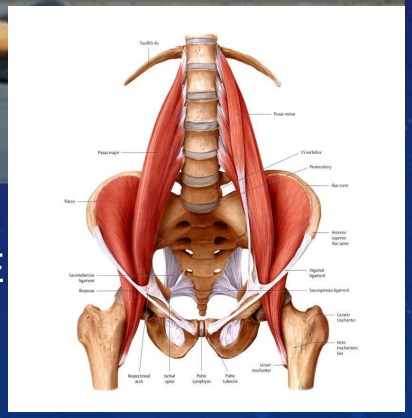





MakeAGIF.com

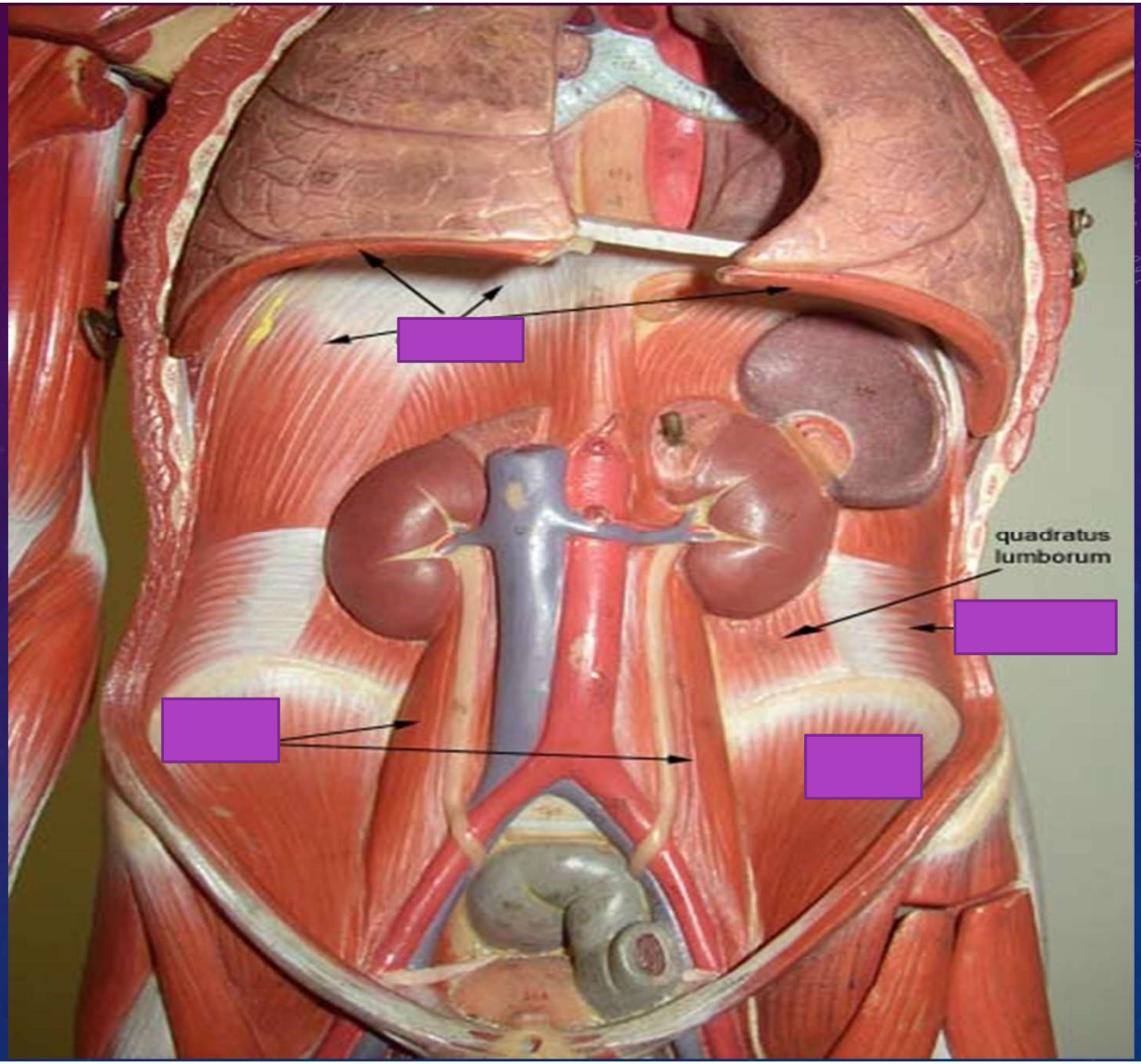

Twelfth rib
Psoas minor
Psoas major
L5 vertebra
Promontory
Iliac crest
Iliacus
Anterior superior iliac spine
Inguinal ligament
Sacrotuberous ligament
Pectineus
Sacrospinous ligament
Greater trochanter
Inter-trochanteric line
Lesser trochanter
Iliopectineal arch
Ischial spine
Pubic symphysis
Pubic tubercle

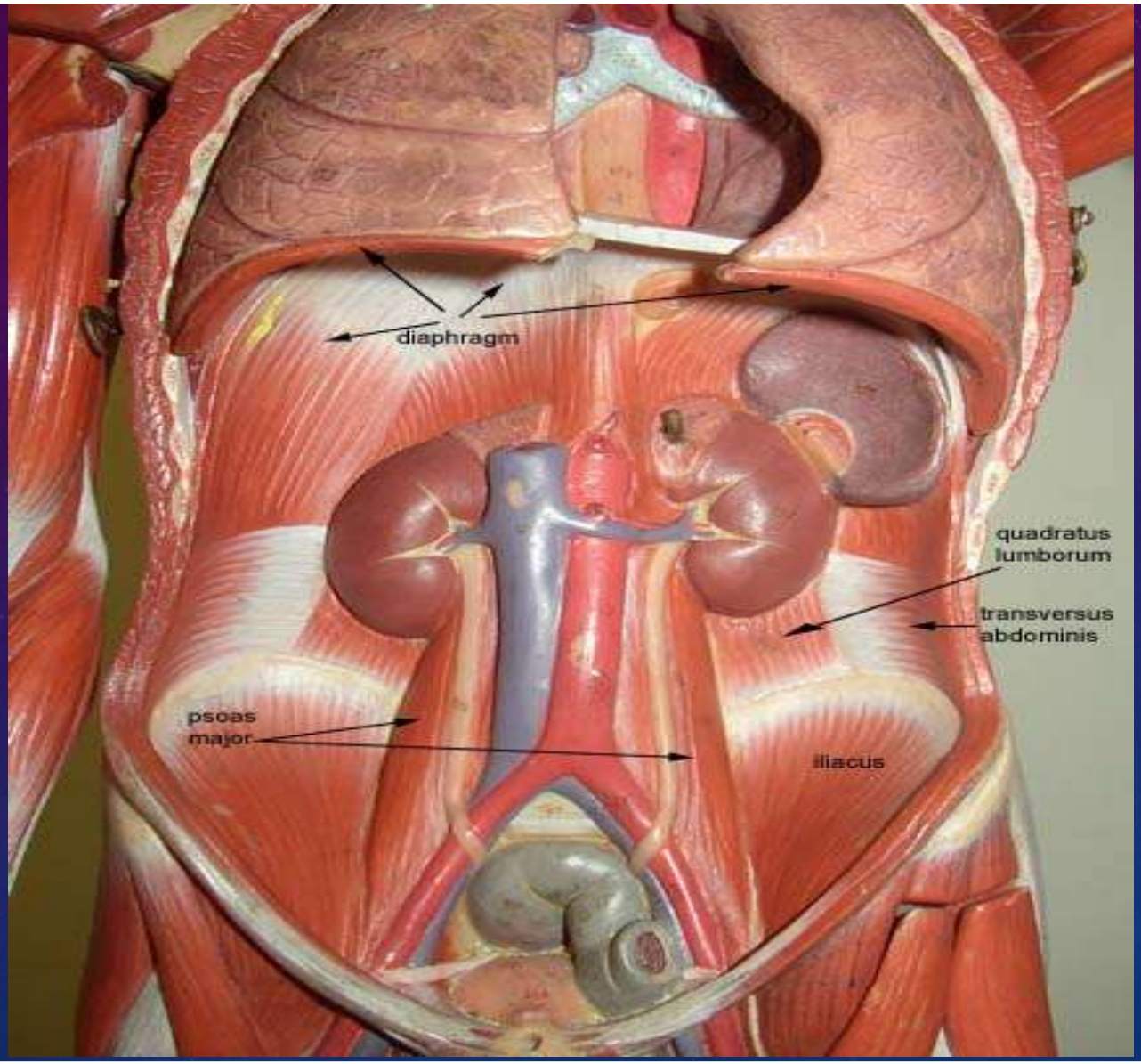


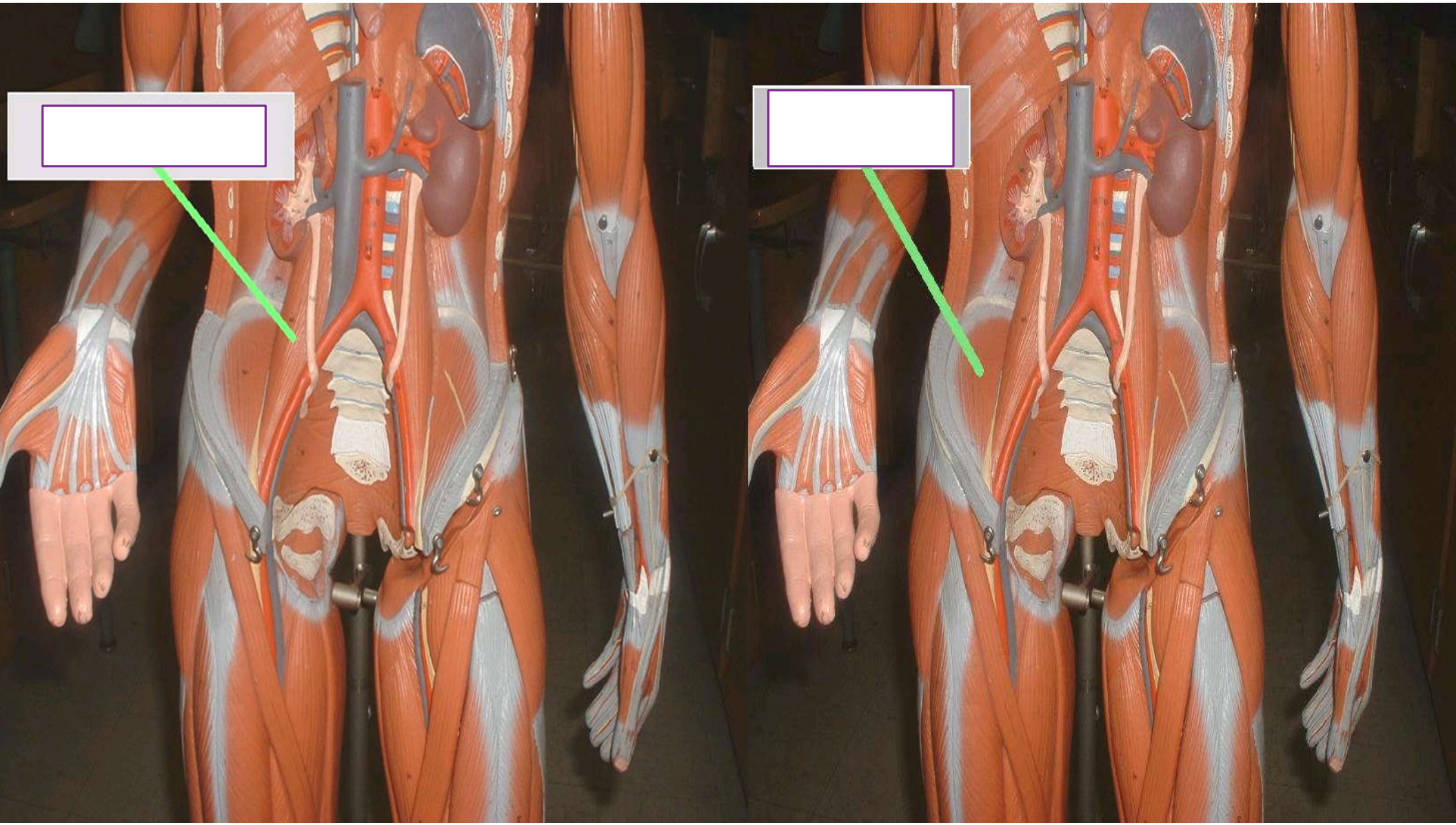


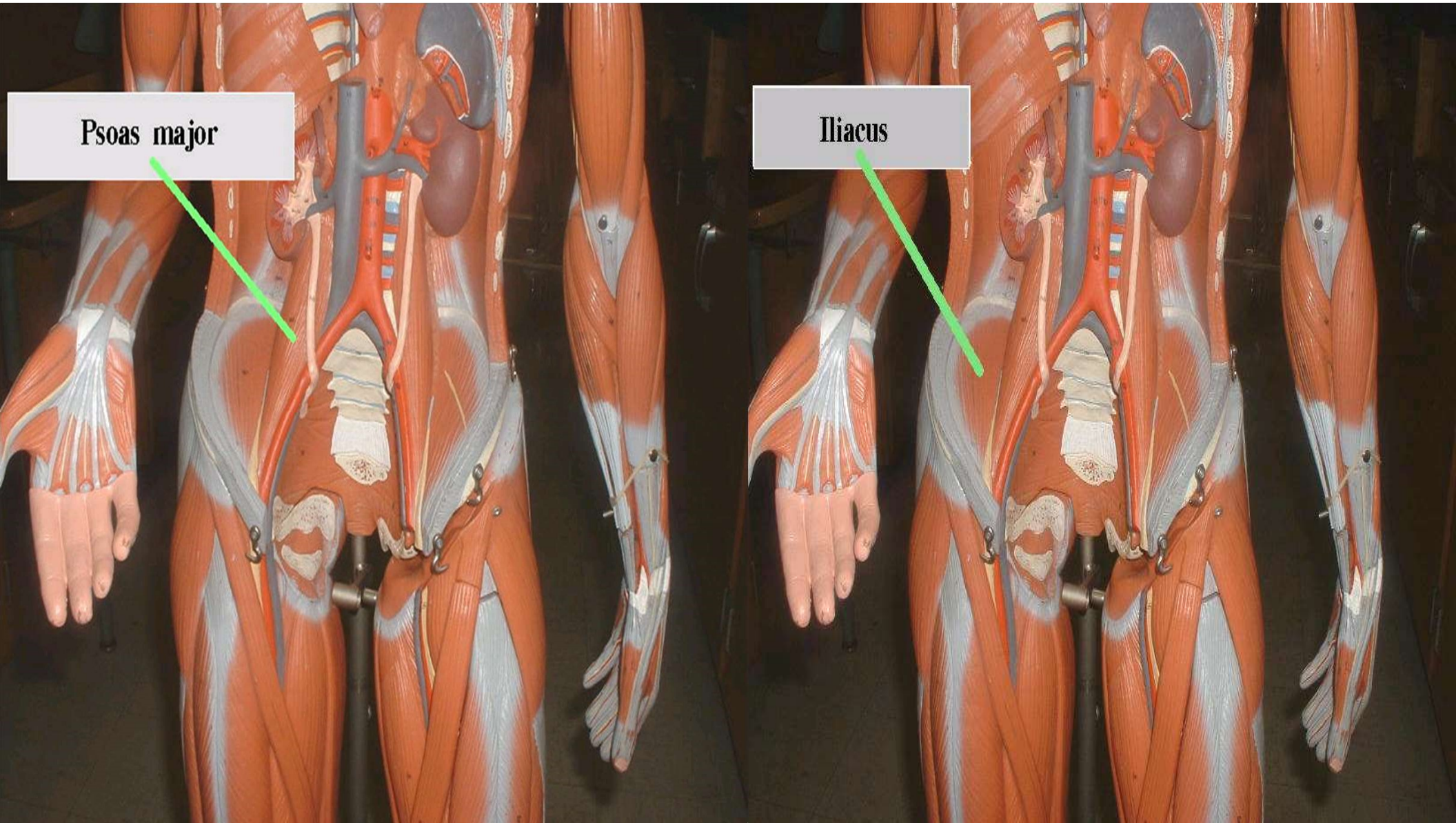
- **The psoas muscle** is located in the lower lumbar region of the spine
- extends through the pelvis to the femur.
- This muscle works by flexing the hip joint and lifting the upper leg towards the body.
- A common example of the movement created from this muscle is walking

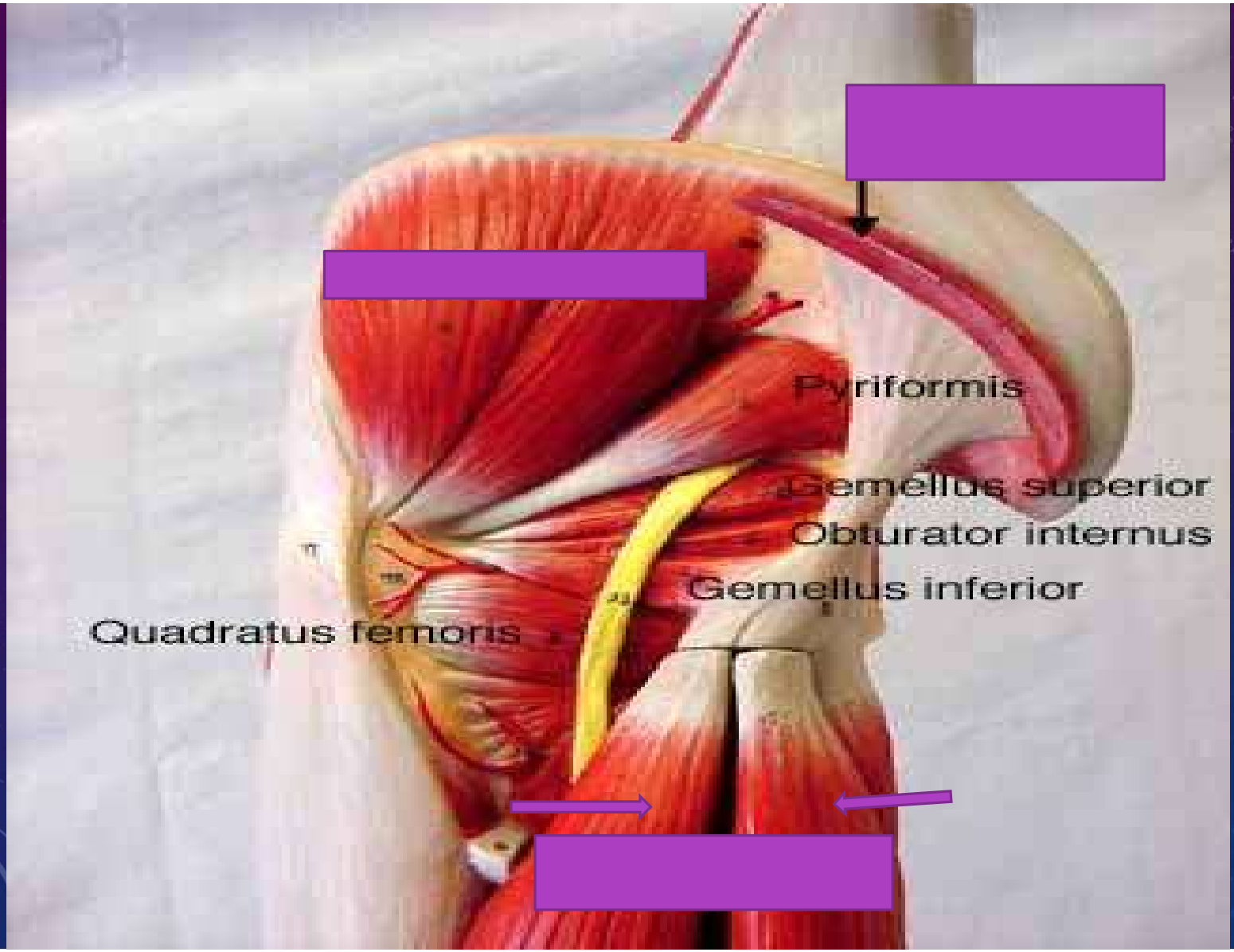
THE PSOAS MUSCLE

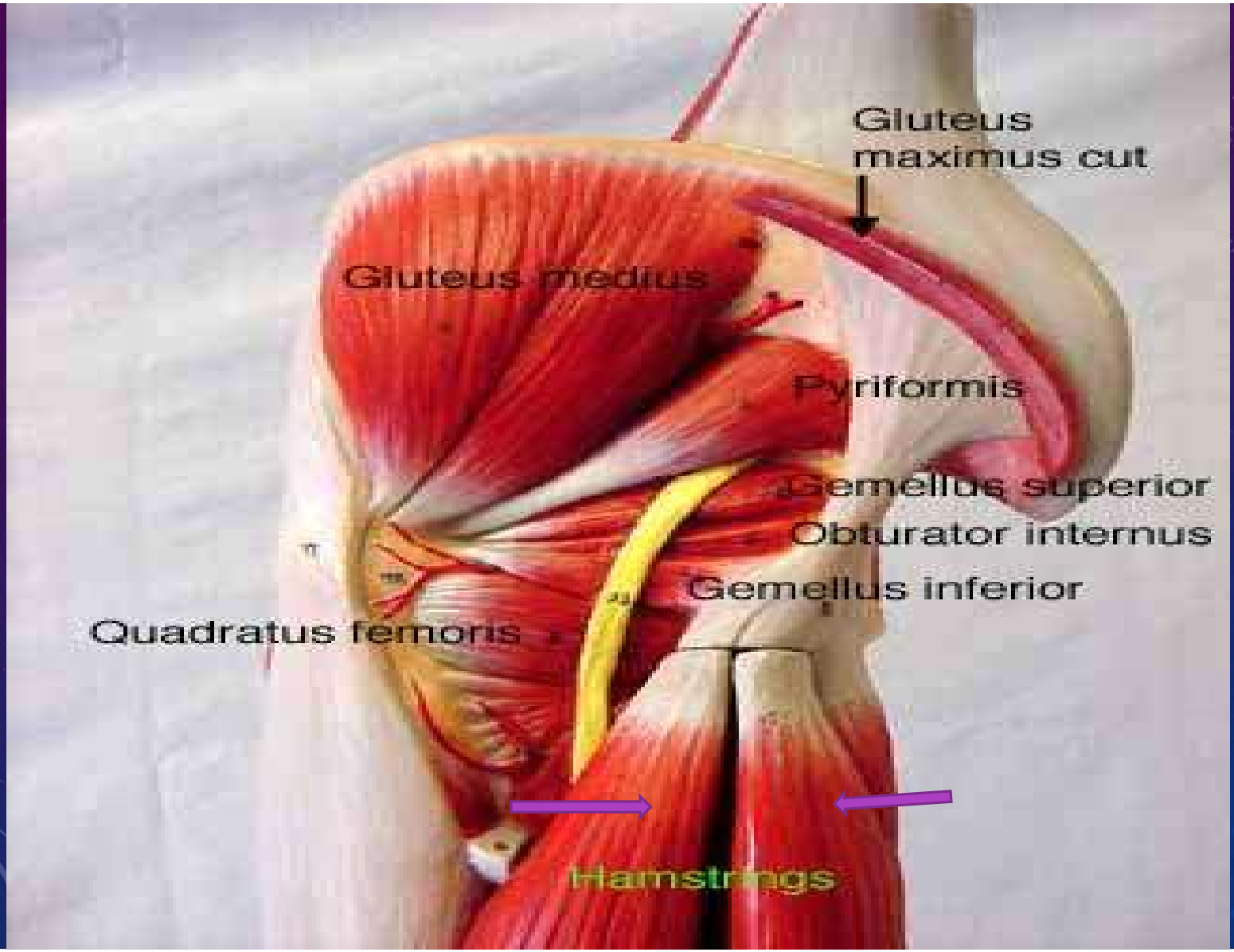

quadratus
lumborum

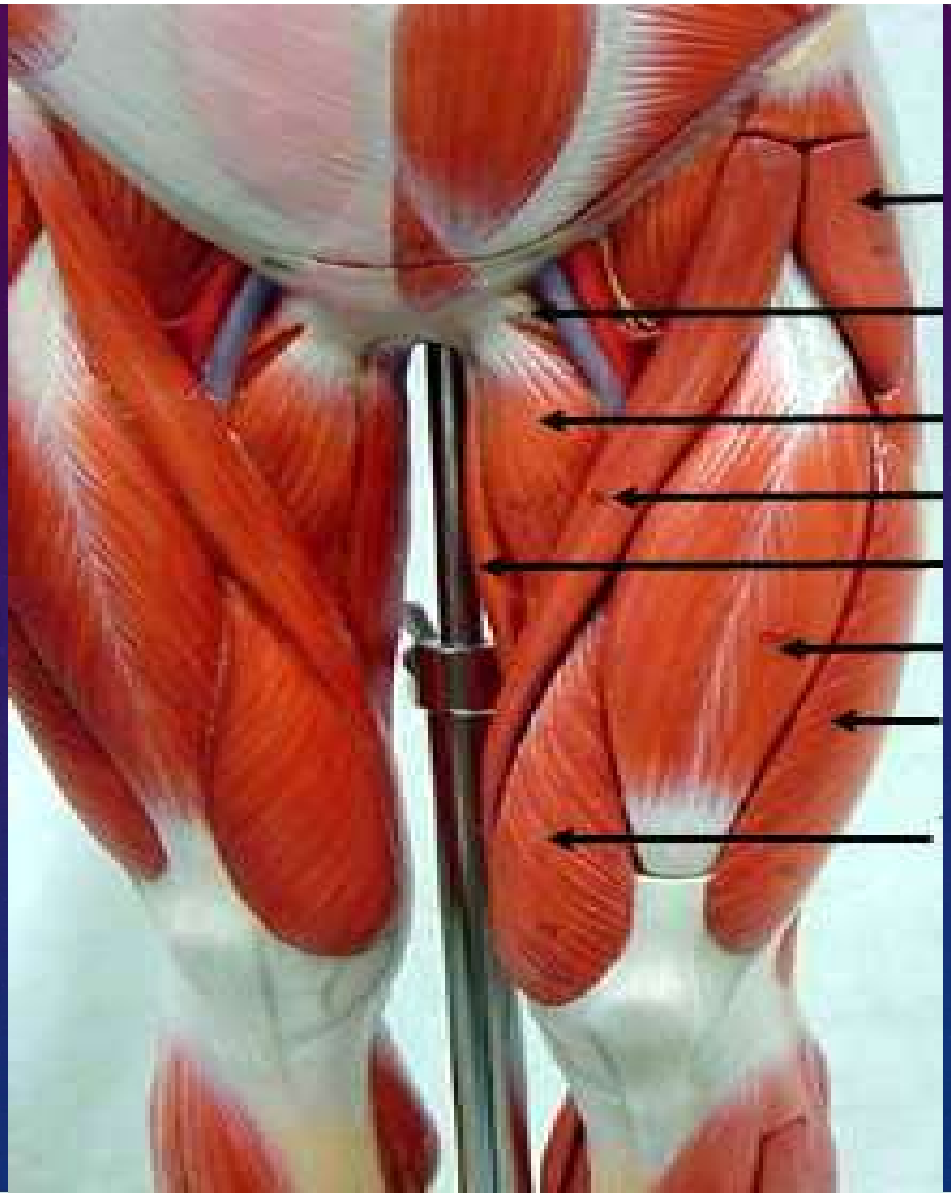

diaphragm
quadratus
lumborum
transversus
abdominis
psoas
major
iliacus

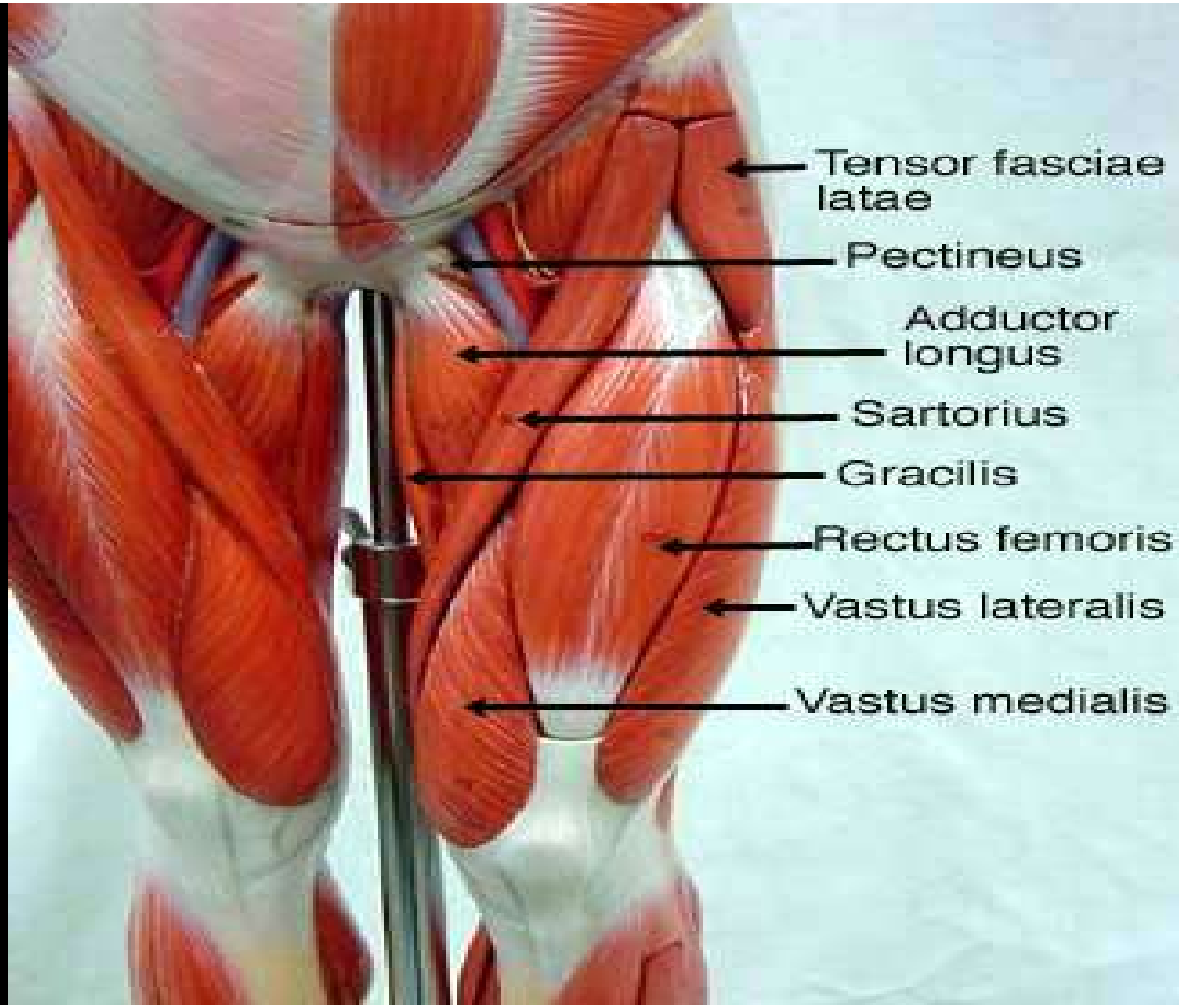


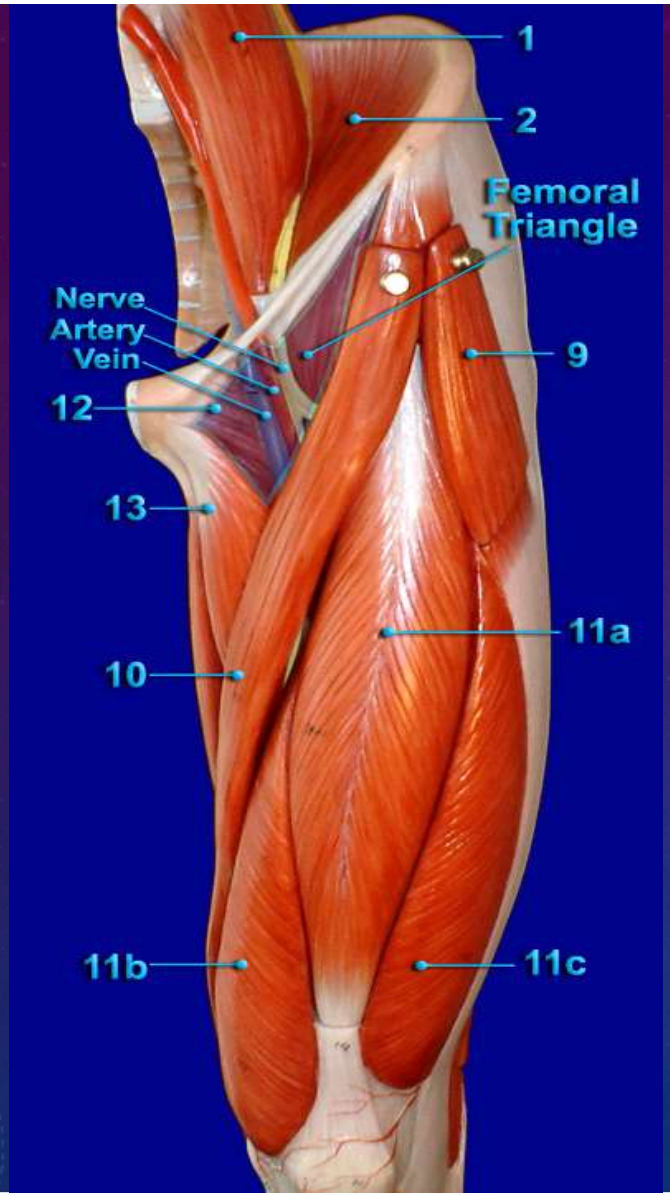

Psoas major
Iliacus

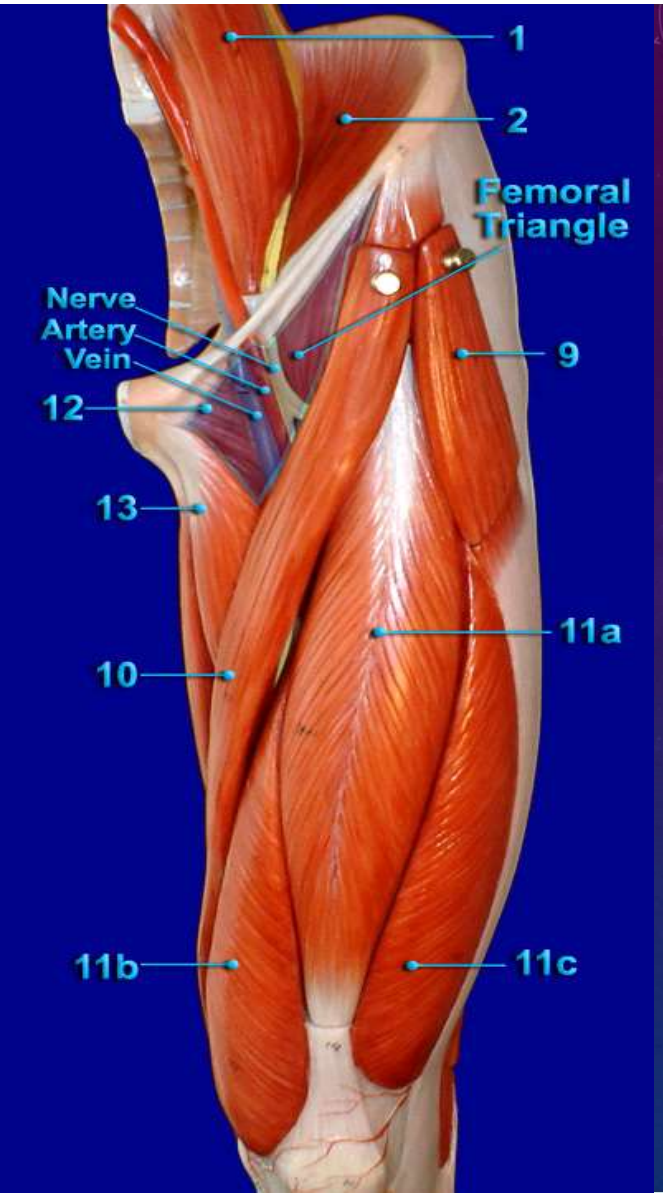

Pyriformis
Gemellus superior
Obturator internus
Gemellus inferior
Quadratus femoris


Gluteus maximus cut
Gluteus medius
Pyriformis
Gemellus superior
Obturator internus
Gemellus inferior
Quadratus femoris
Hamstrings

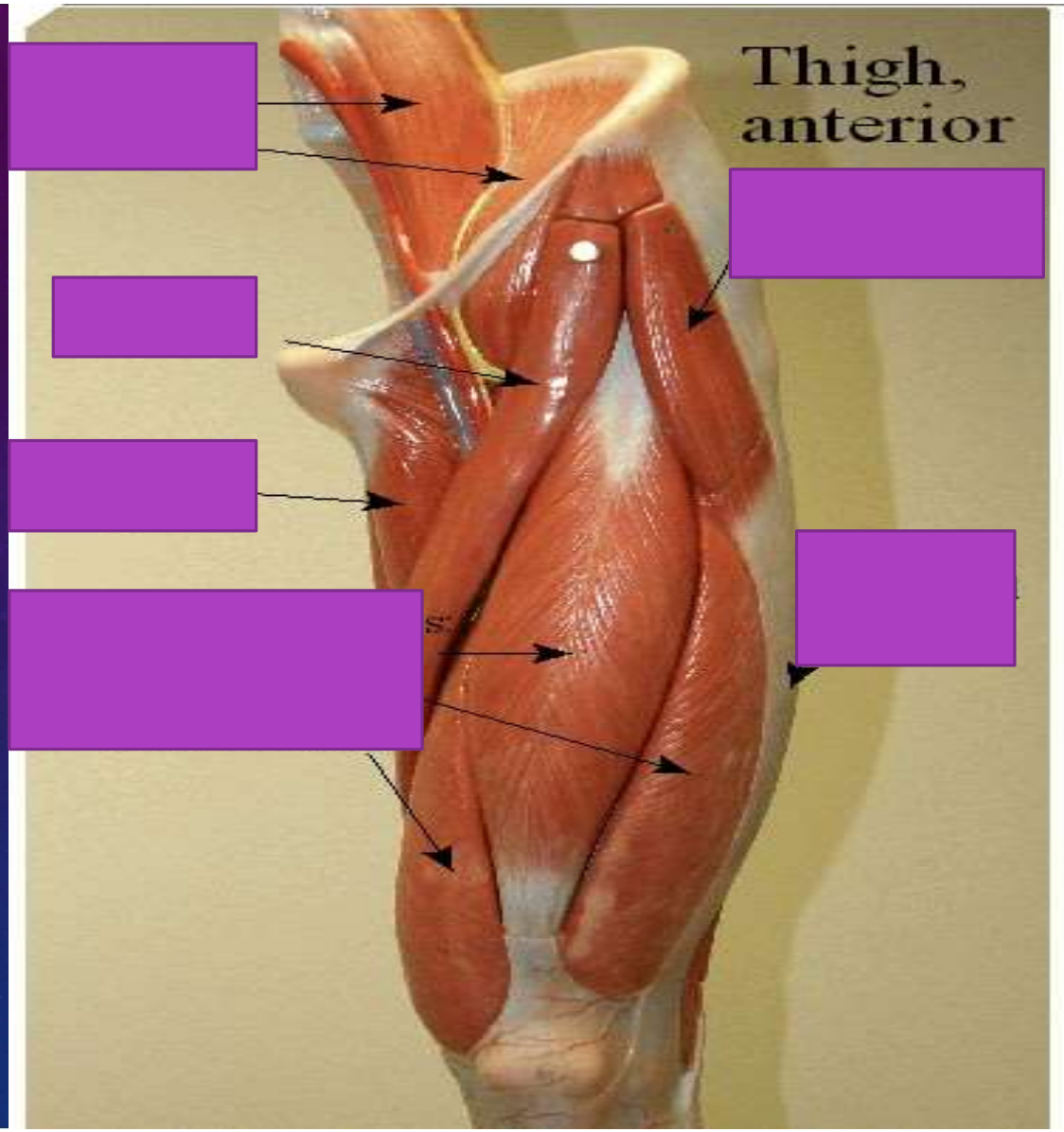


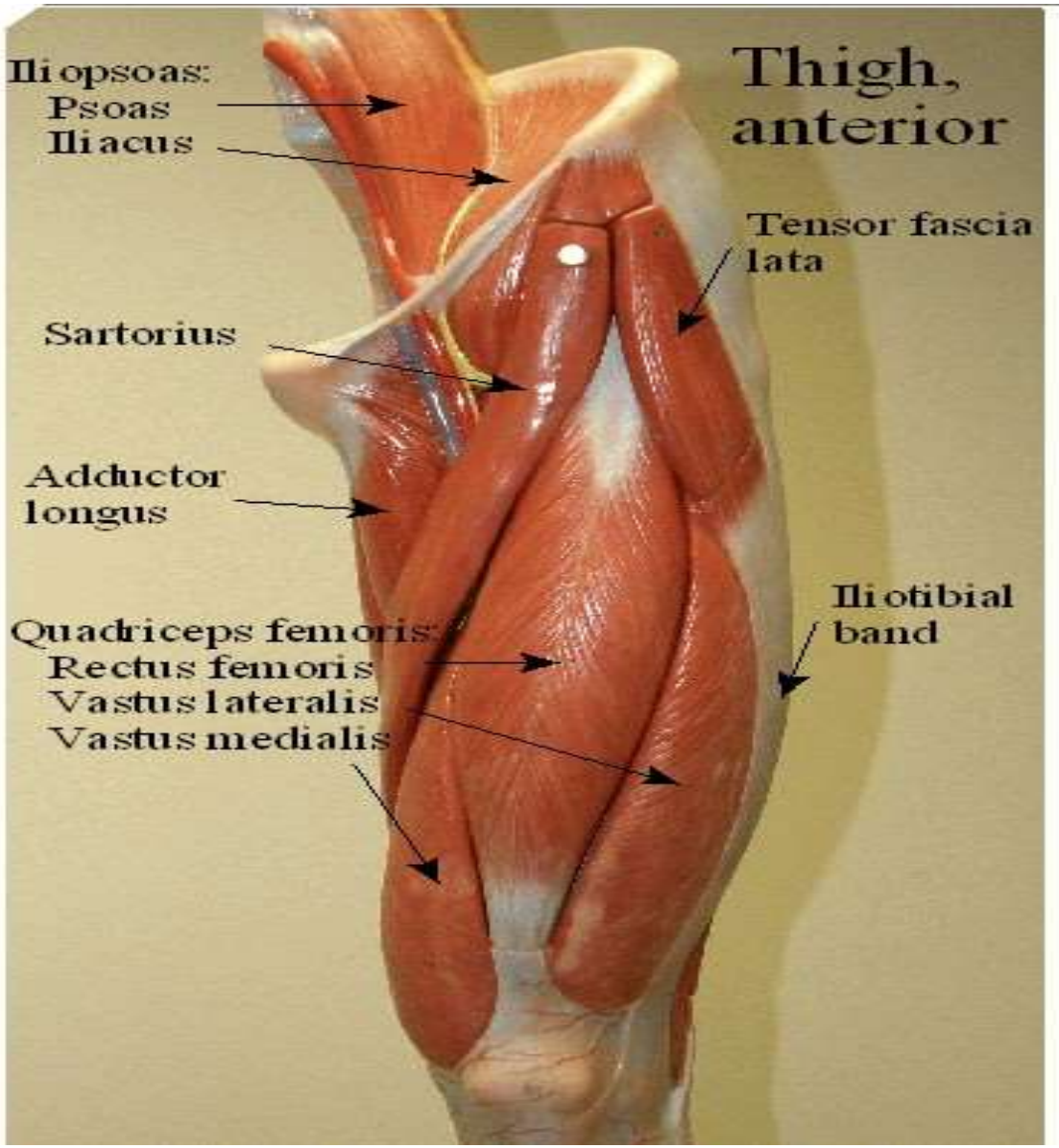

Tensor fasciae latae
Pectineus
Adductor longus
Sartorius
Gracilis
Rectus femoris
Vastus lateralis
Vastus medialis

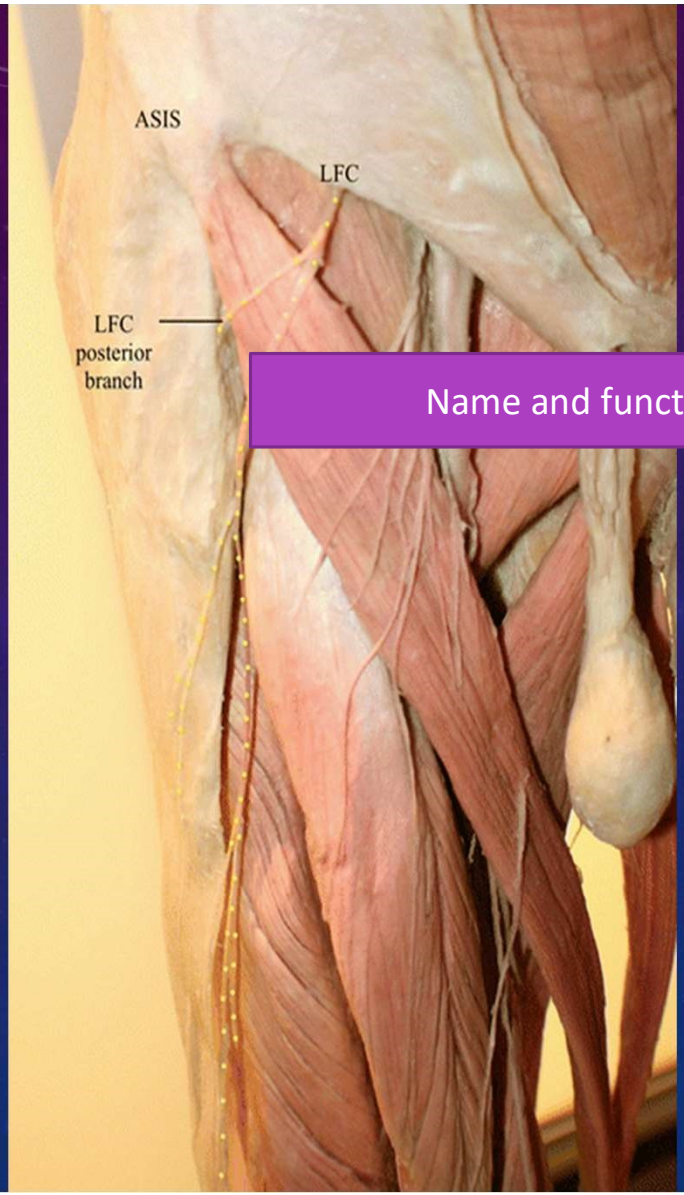

1
2
Femoral Triangle
Nerve
Artery
Vein
9
12
13
11a
10
11b
11c



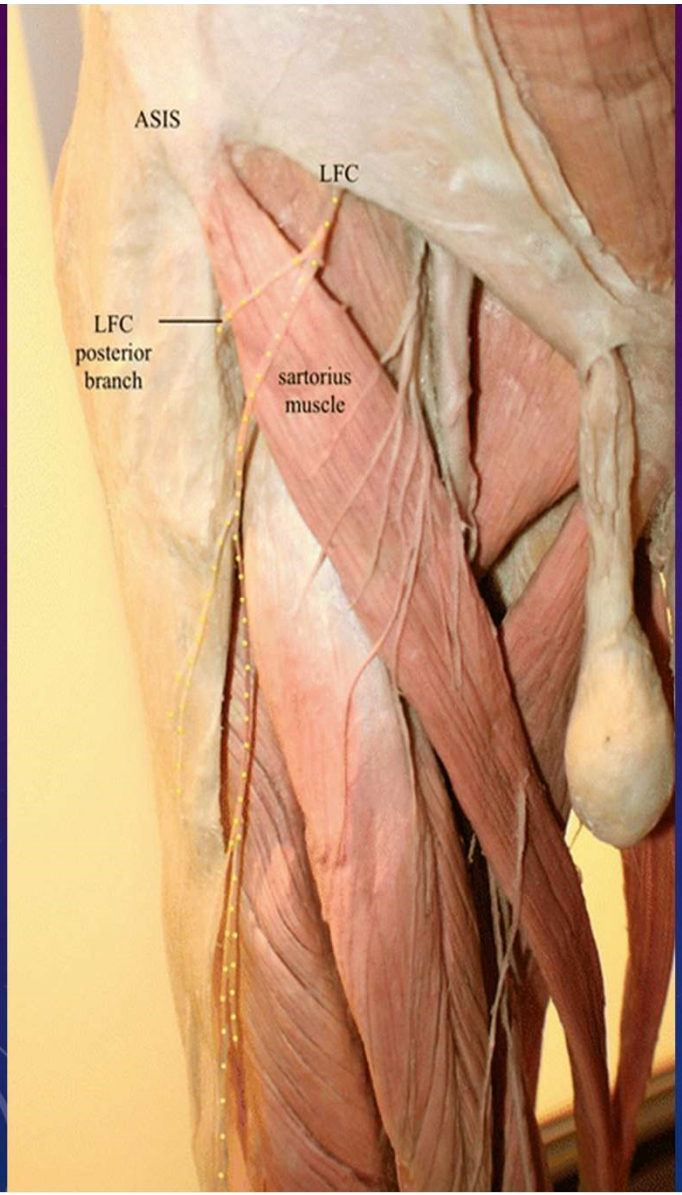
1. Psoas Major
2. Iliacus
9. Tensor Fasciae Latae
10. Sartorius
11a. Rectus Femoris
11b. Vastus Medialis
11c. Vastus Lateralis
12. Pectineus
13. Adductor Longus


Thigh, anterior


Thigh, anterior
Iliopsoas:
Psoas
Iliacus
Tensor fascia lata
Sartorius
Adductor longus
Iliotibial band
Quadriceps femoris:
Rectus femoris
Vastus lateralis
Vastus medialis

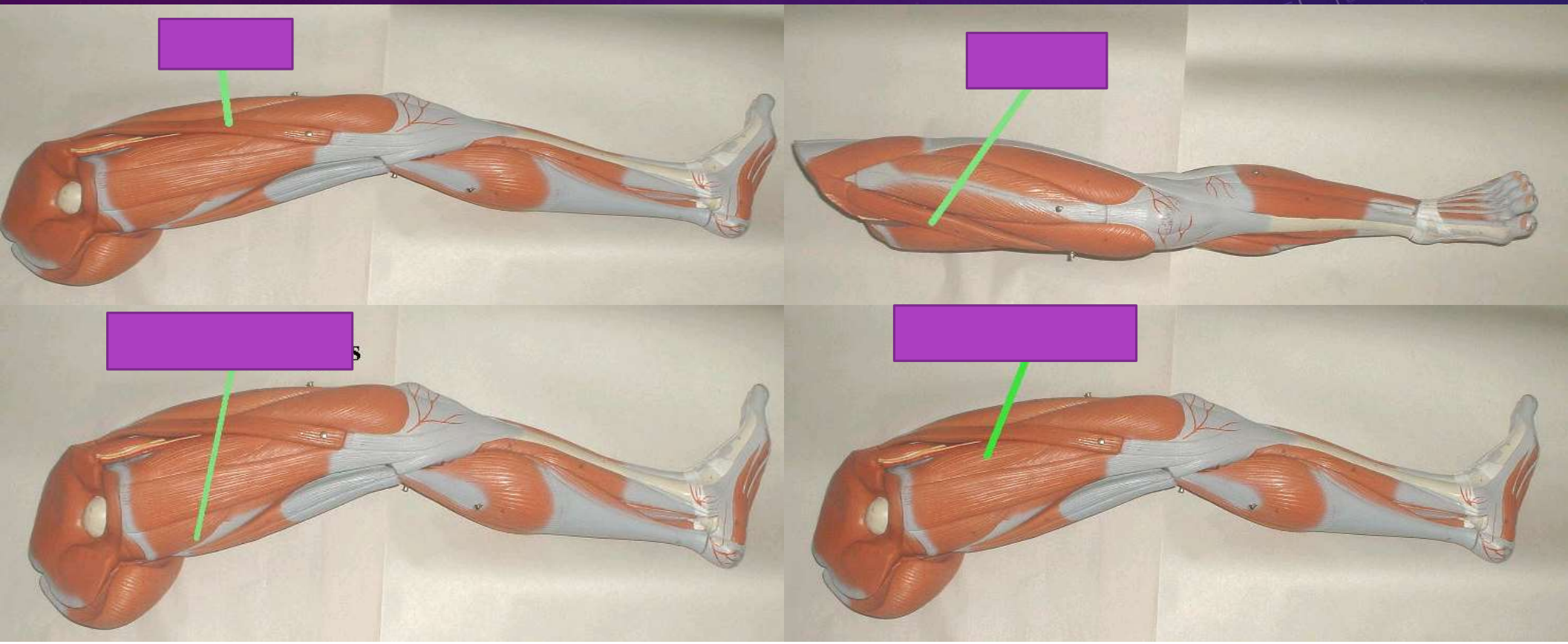


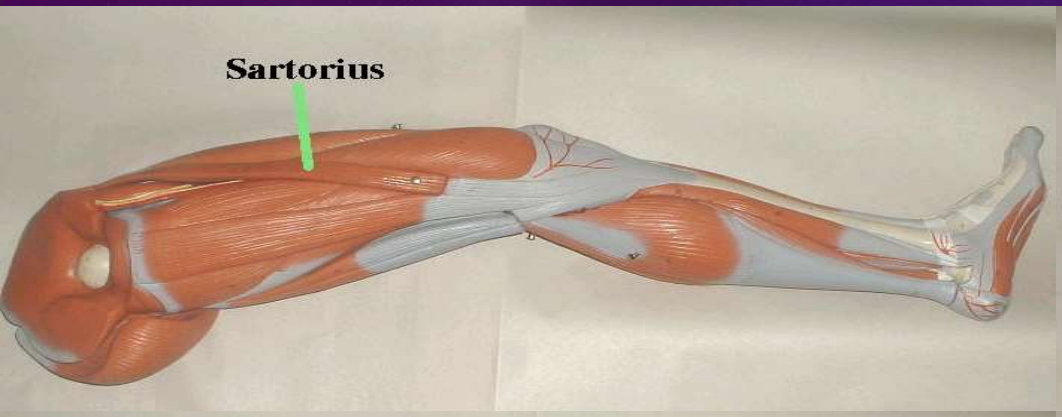
Name and function?

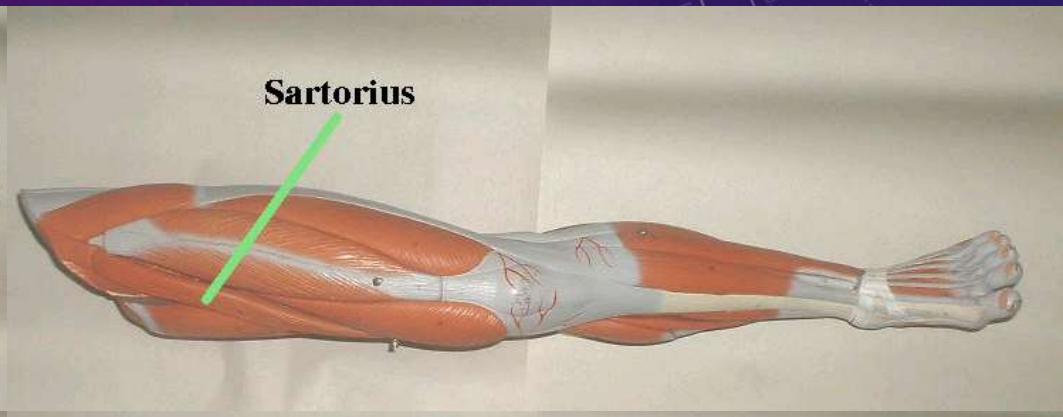


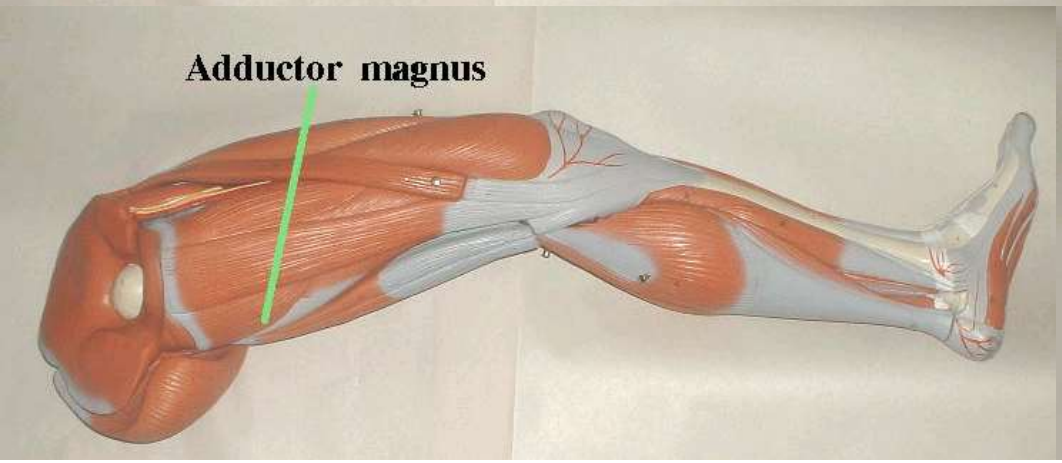
As this muscle contracts, the thigh flexes and rotates [knee and tigh flexors]

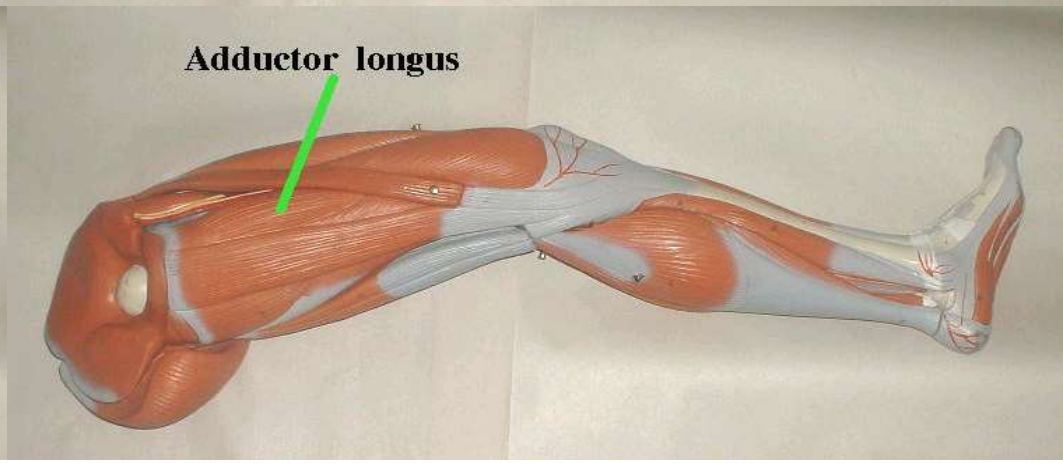
sartorius

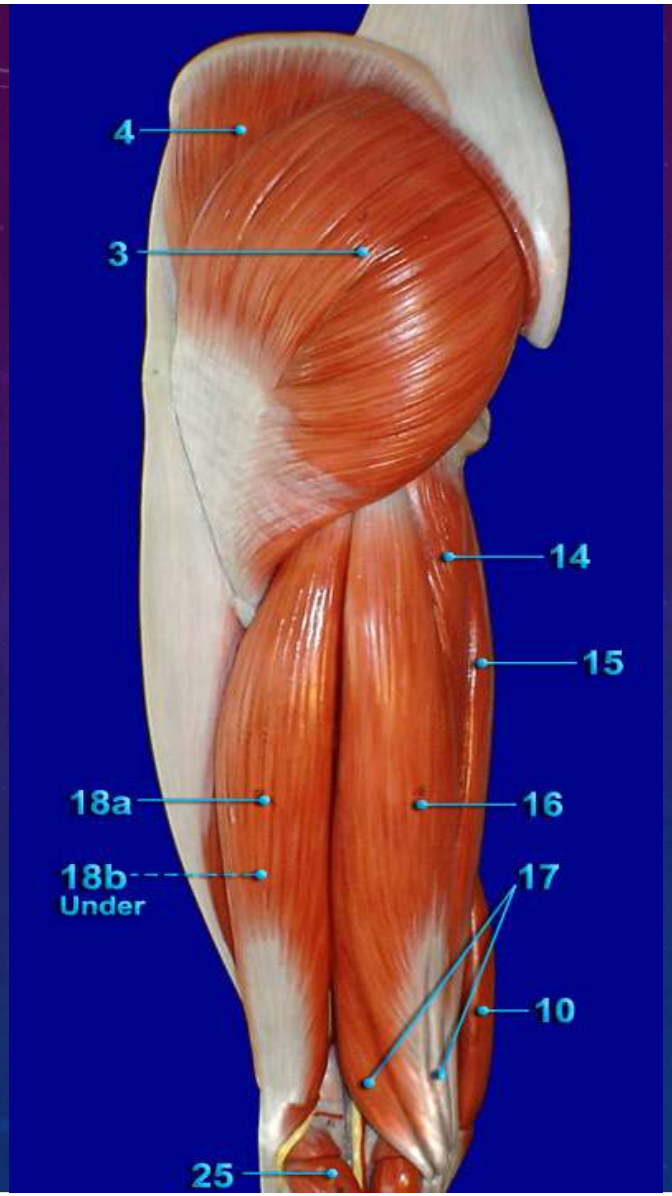


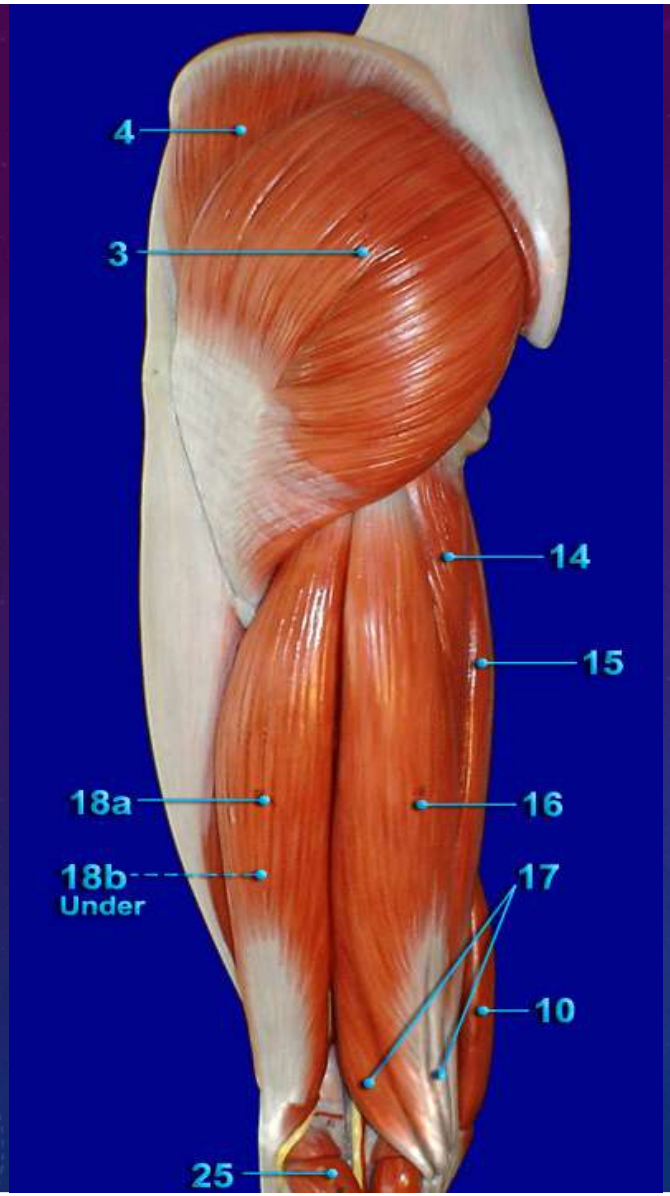

Sartorius


Sartorius

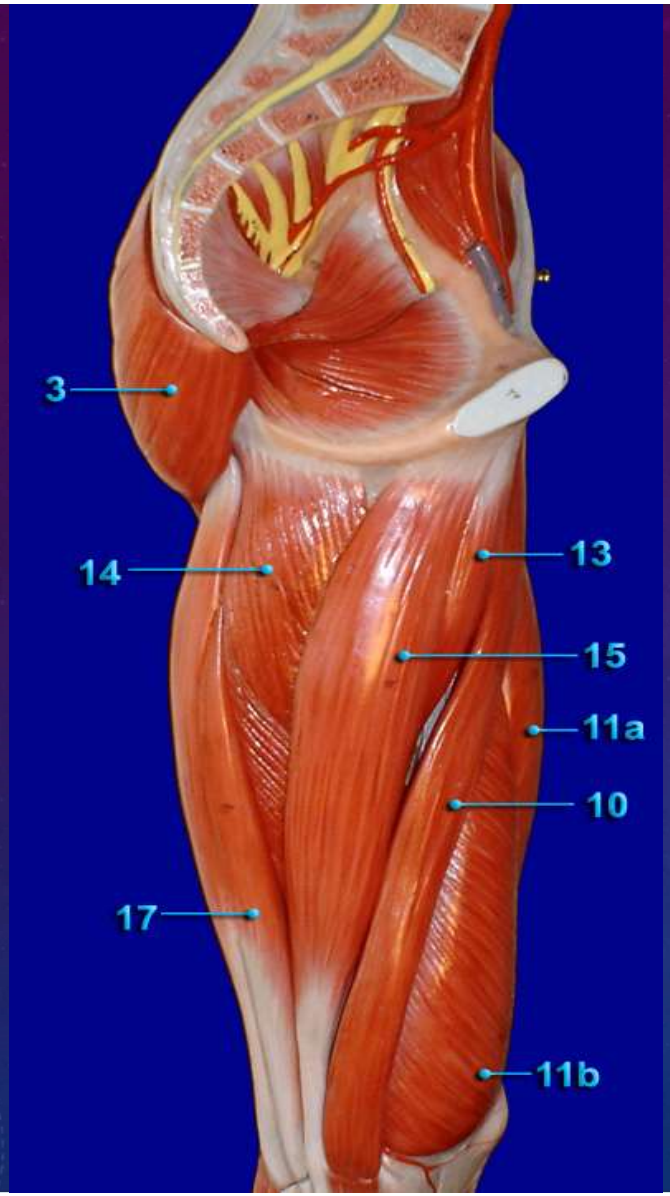

Adductor magnus


Adductor longus

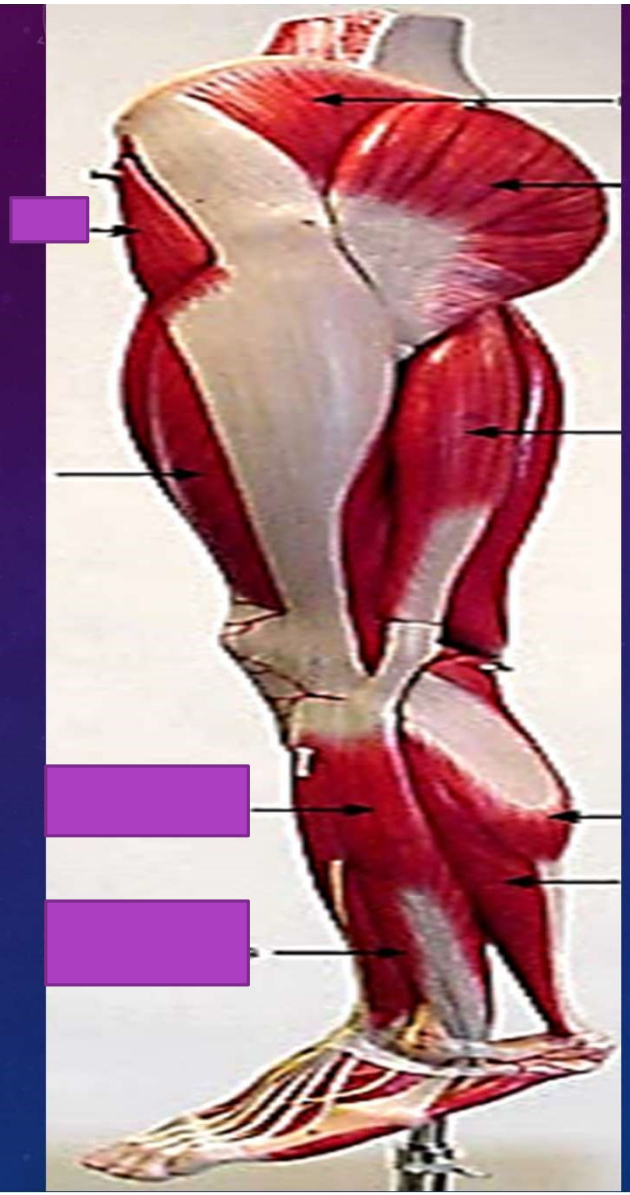

4
3
14
15
18a
16
18b
Under
17
10
25

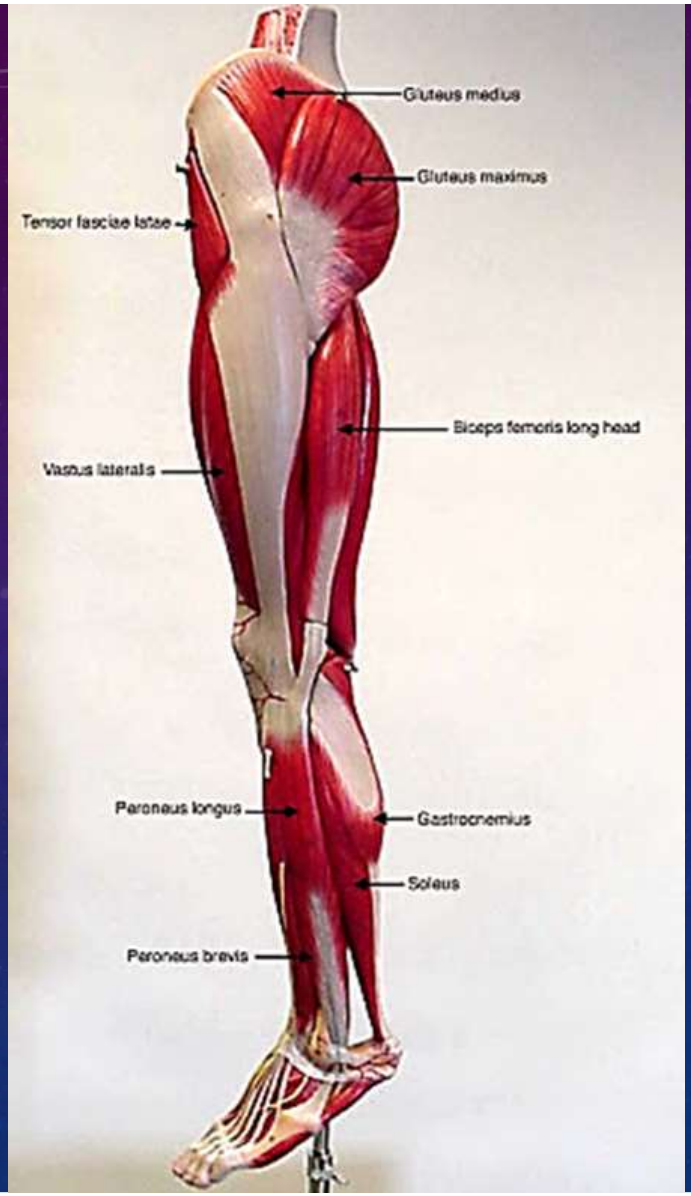


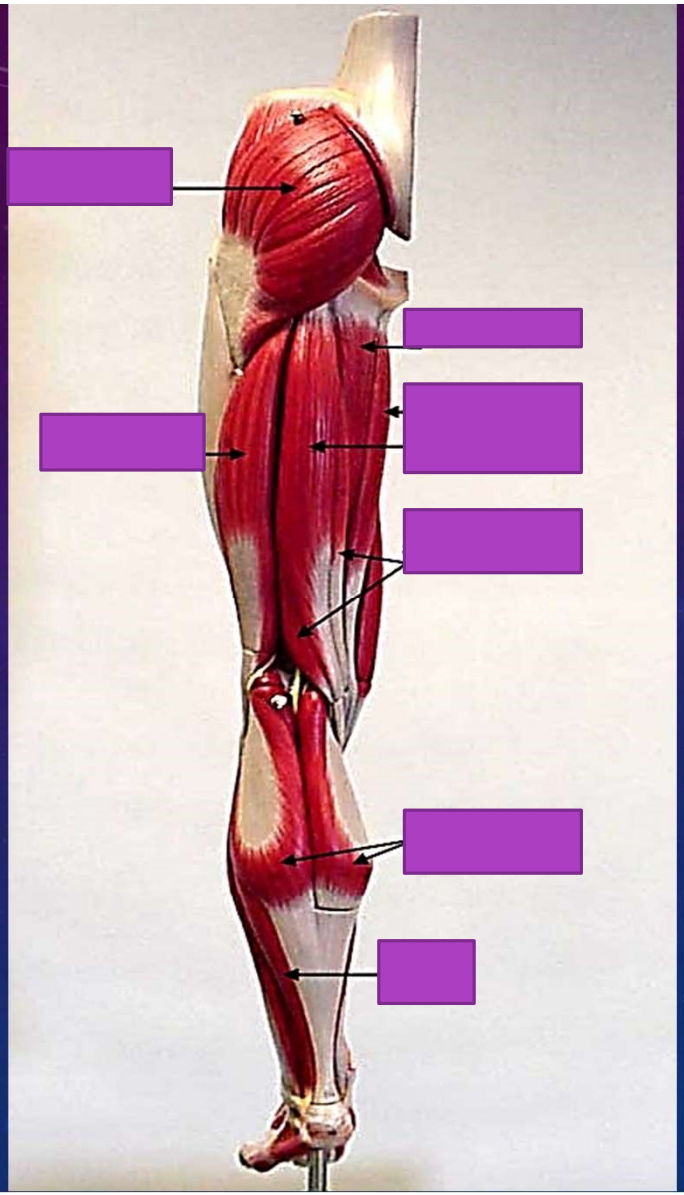
3. Gluteus Maximus
4. Gluteus Medius
10. Satorius
14. Adductor Magus
15. Gracilis
16. Semitendinosus
17. Semimembranous
18a. Biceps Femoris (long head)
18b. Biceps Femoris (short head)
25. Plantaris

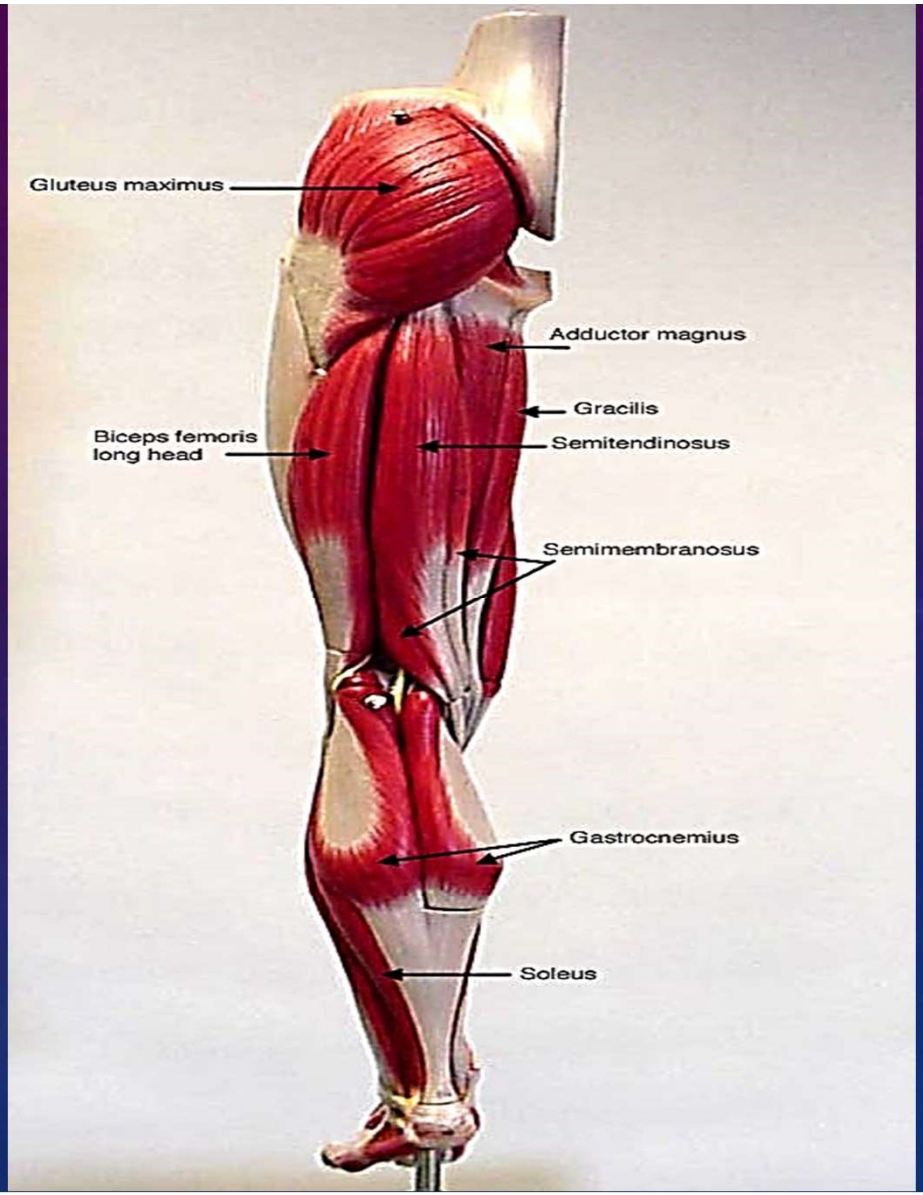


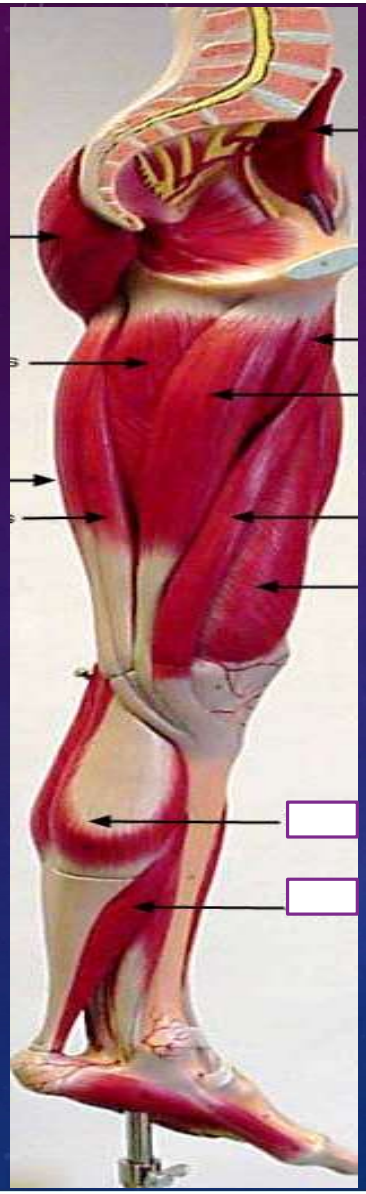
3. Gluteus Maximus
10. Sartorius
11a. Rectus Femoris
11b. Vastus Medialis
13. Adductor Longus
14. Adductor Magnus
15. Gracilis
17. Semimembranosus

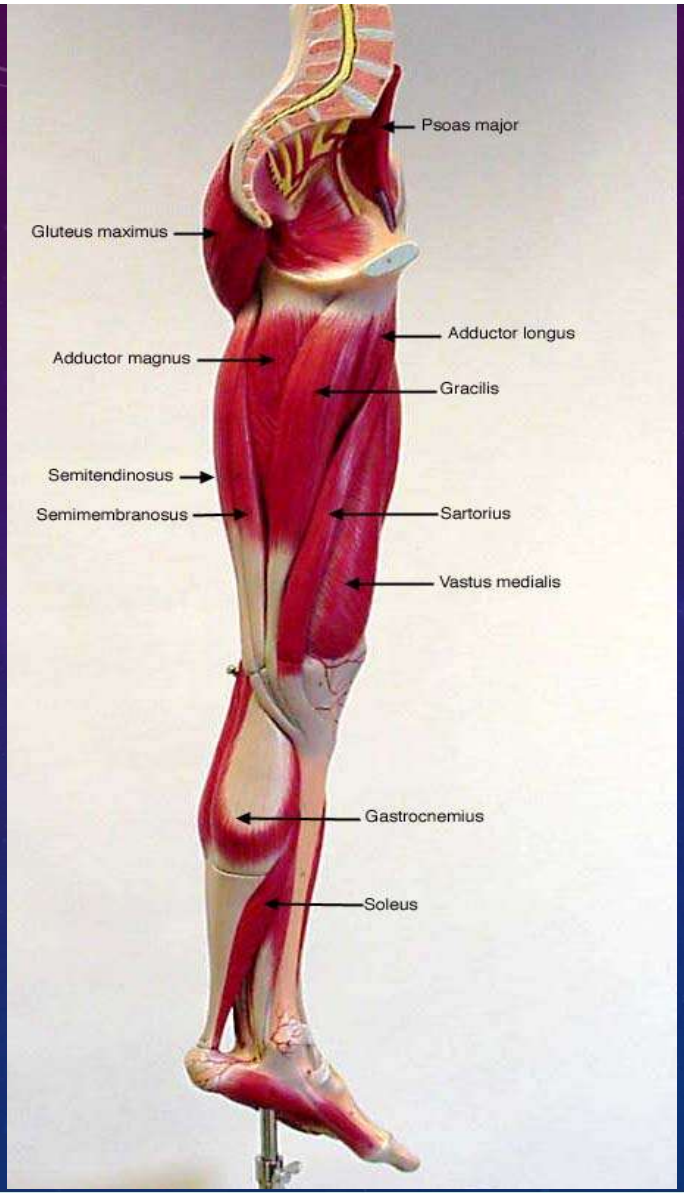


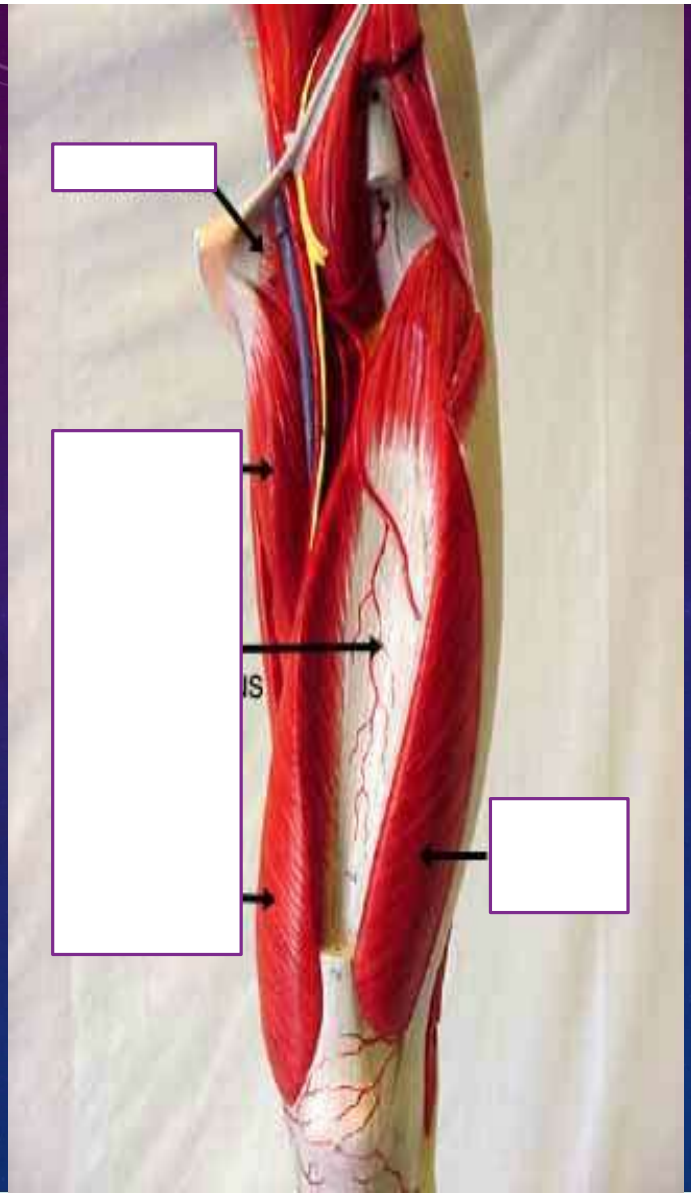

Gluteus medius
Gluteus maximus
Tensor fasciae latae
Biceps femoris long head
Vastus lateralis
Peroneus longus
Gastrocnemius
Soleus
Peroneus brevis

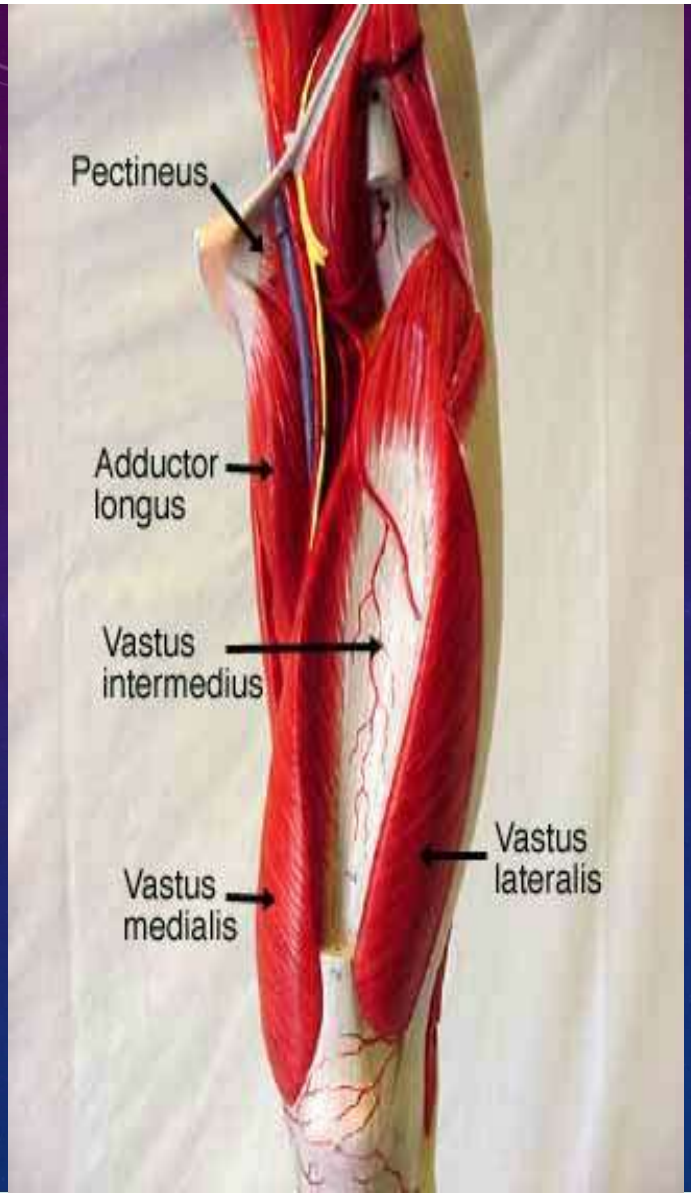


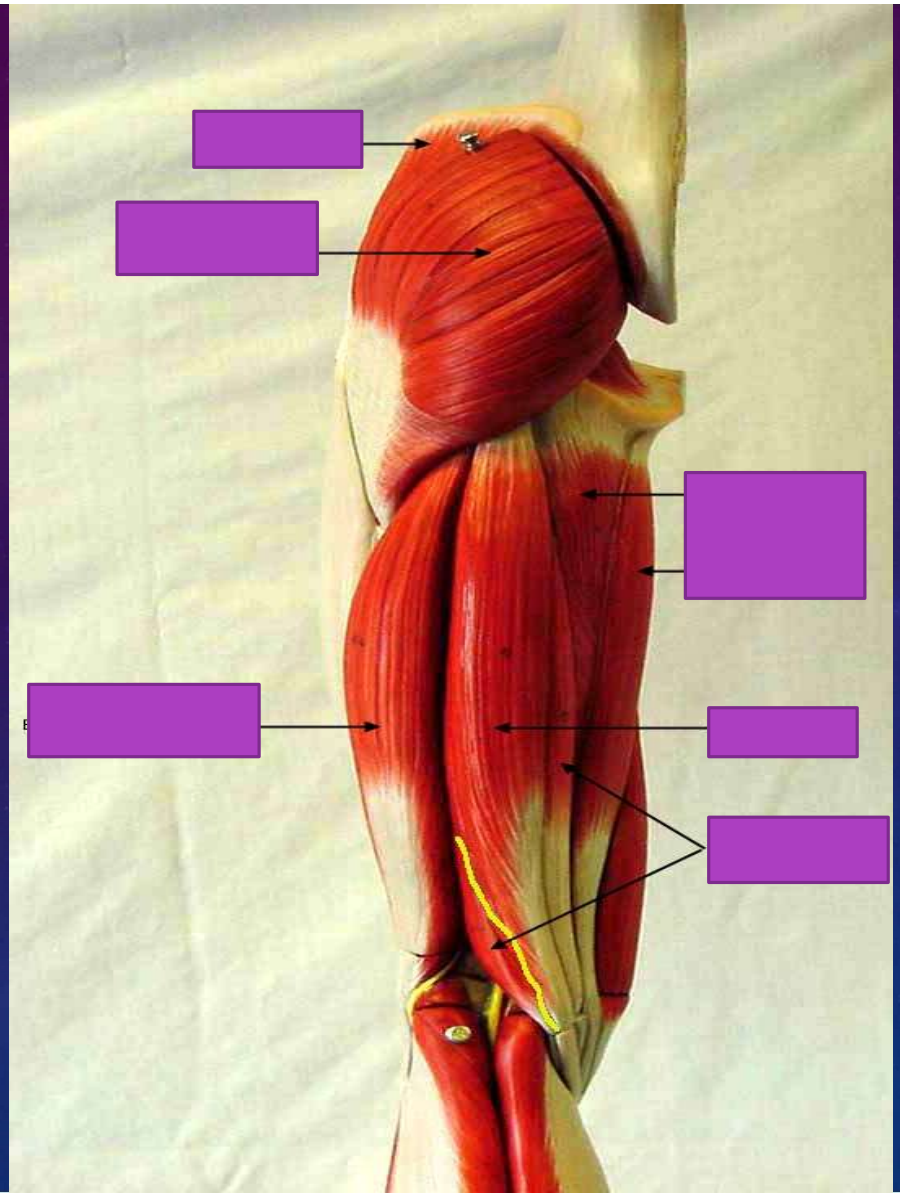

Gluteus maximus
Adductor magnus
Gracilis
Biceps femoris
long head
Semitendinosus
Semimembranosus
Gastrocnemius
Soleus

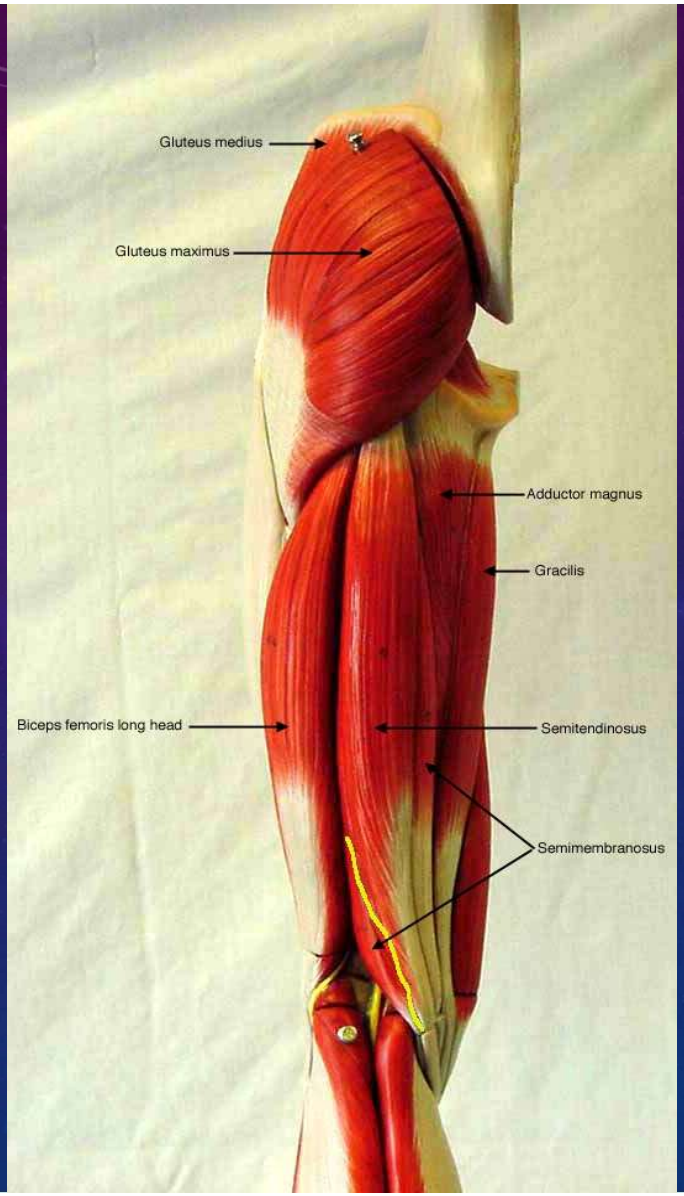


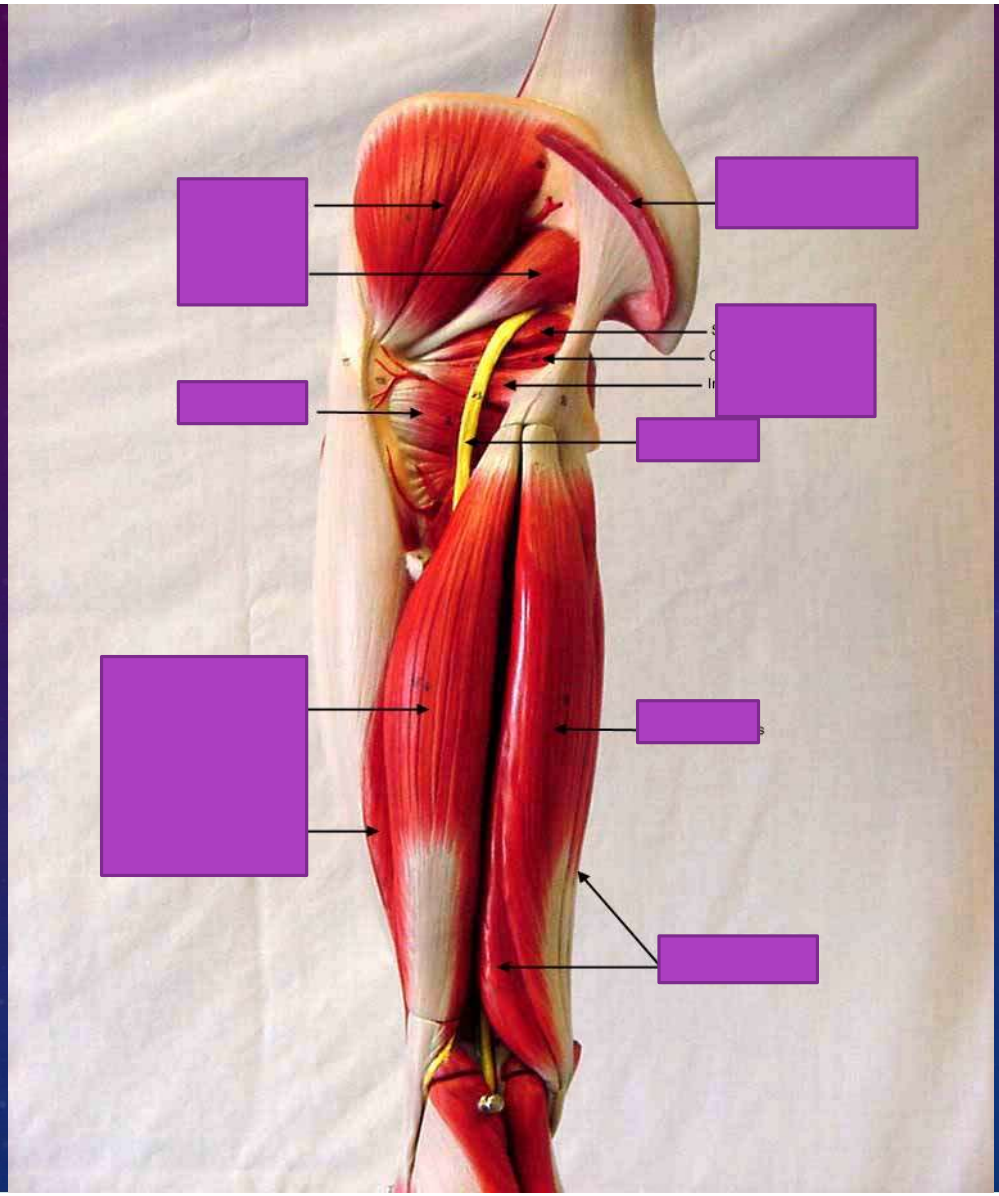

Psoas major
Gluteus maximus
Adductor longus
Adductor magnus
Gracilis
Semitendinosus
Semimembranosus
Sartorius
Vastus medialis
Gastrocnemius
Soleus

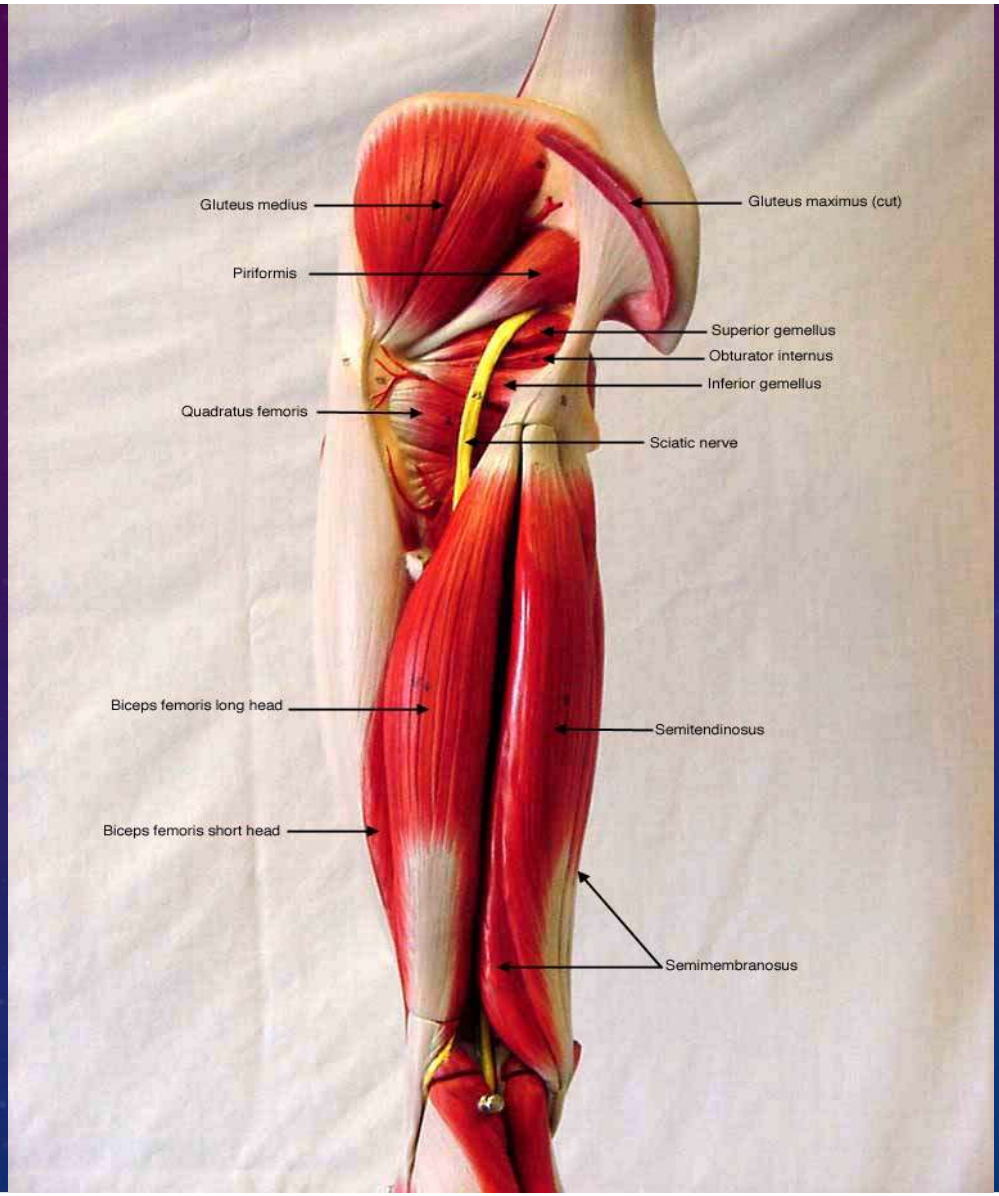


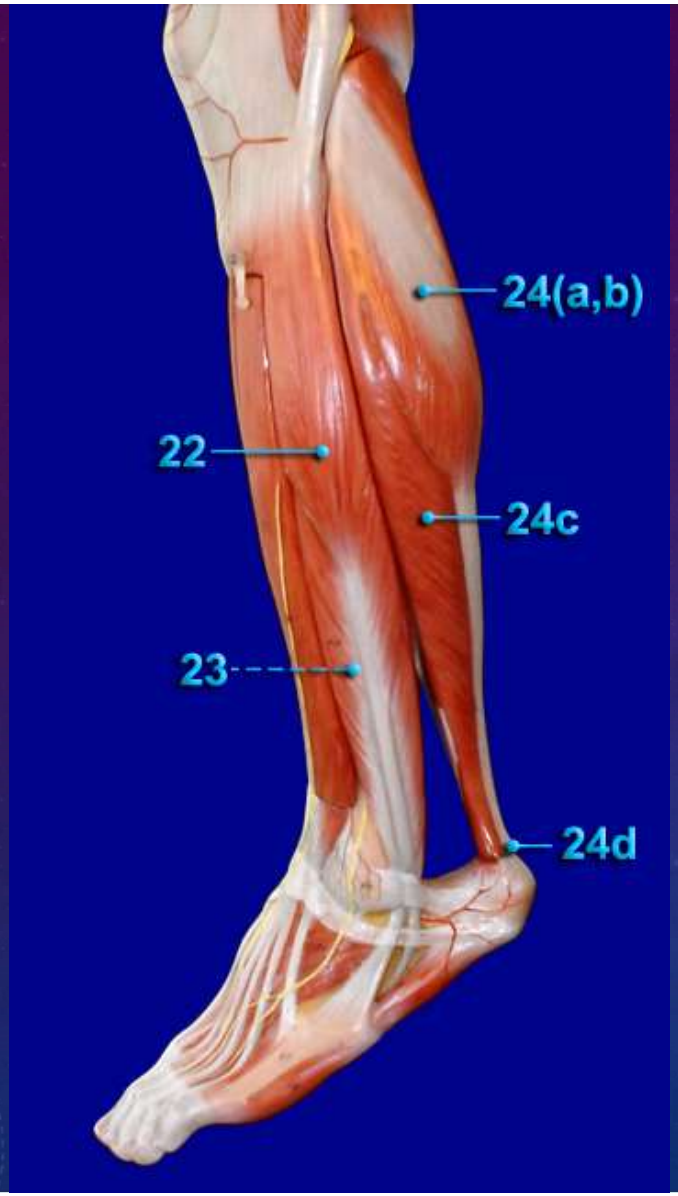

Pectineus
Adductor longus
Vastus intermedius
Vastus lateralis
Vastus medialis



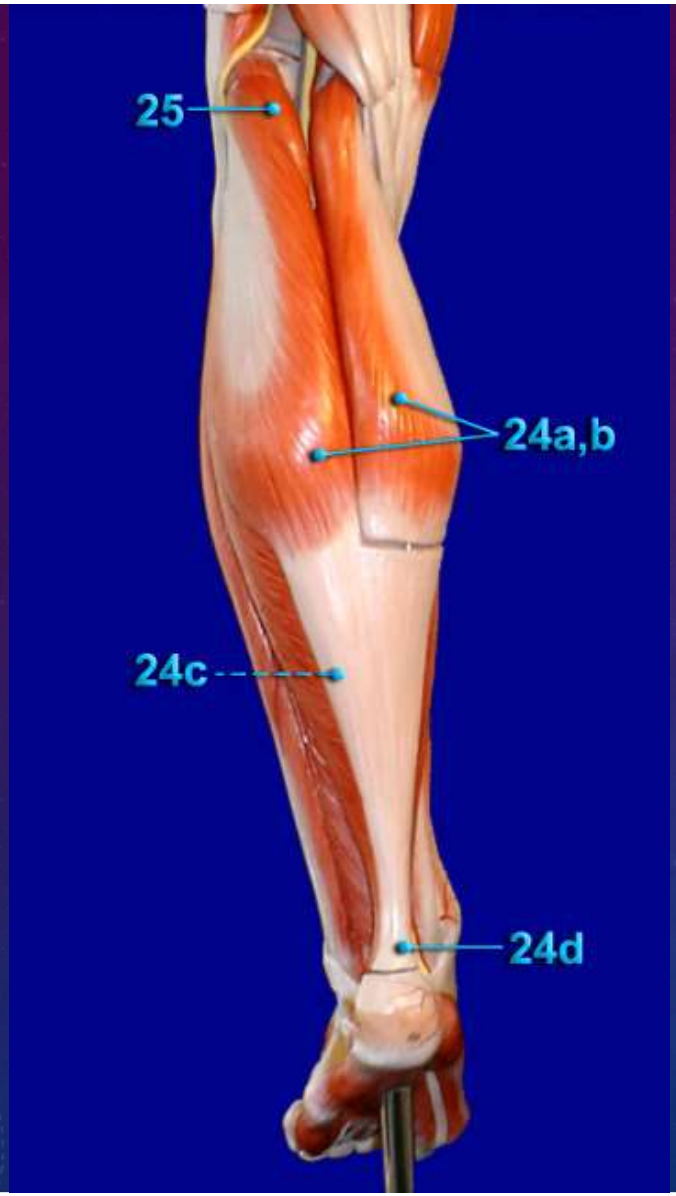

Gluteus medius
Gluteus maximus
Adductor magnus
Gracilis
Biceps femoris long head
Semitendinosus
Semimembranosus




Gluteus medius
Gluteus maximus (cut)
Piriformis
Superior gemellus
Obturator internus
Inferior gemellus
Quadratus femoris
Sciatic nerve
Biceps femoris long head
Semitendinosus
Biceps femoris short head
Semimembranosus



22. Peroneus (Fibularis) Longus
23. Peroneus (Fibularis) Brevis
24(a,b). Gastrocnemius
24(c). Soleus
24(d). Achilles Tendon



25. Plantaris
24 (a,b). Gastrocnemius (medial and lateral heads)

24c. Soleus Muscle (underneath tendon)
24d. Achilles Tendon

*click to the next slide to check your answer

Psoas major

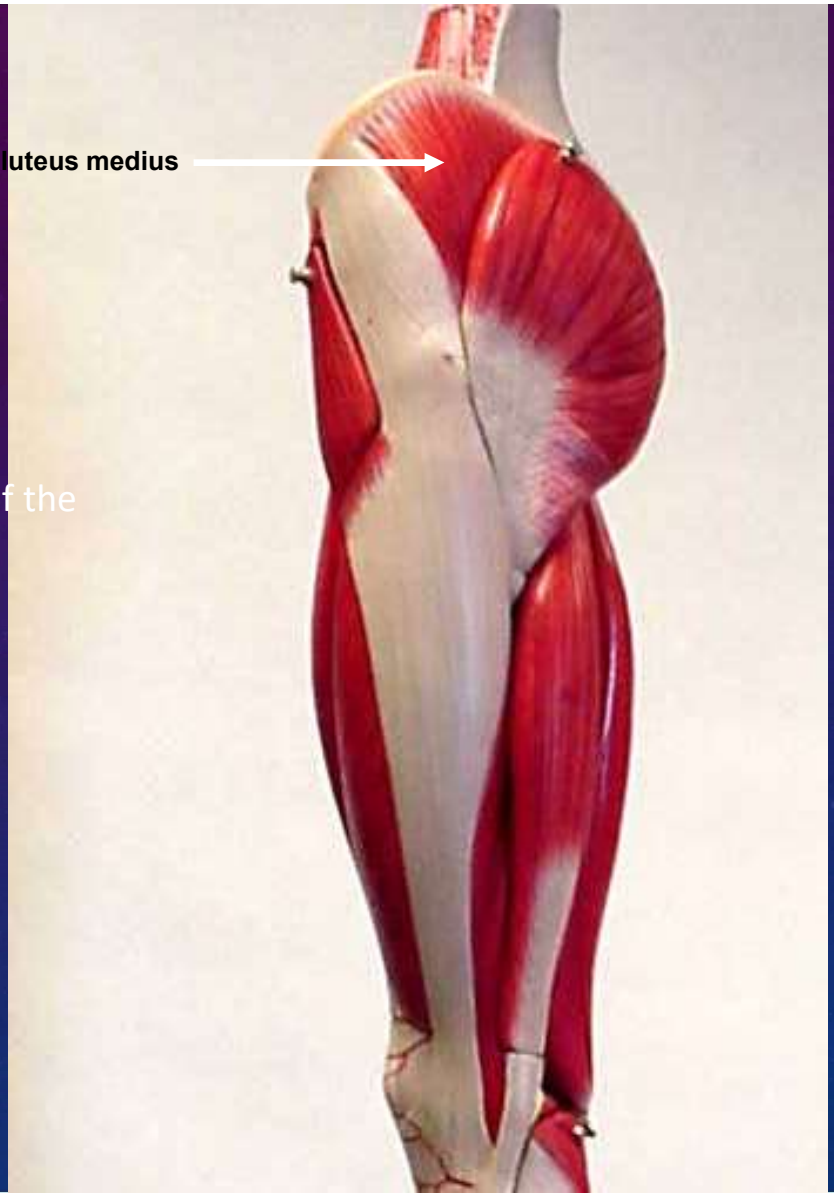
Action: Flexion of the thigh at the hip

*click to the next slide to check your answer

Action: Extension of the leg at the knee

*click to the next slide to check your answer

Action: Abduction of the thigh at the hip



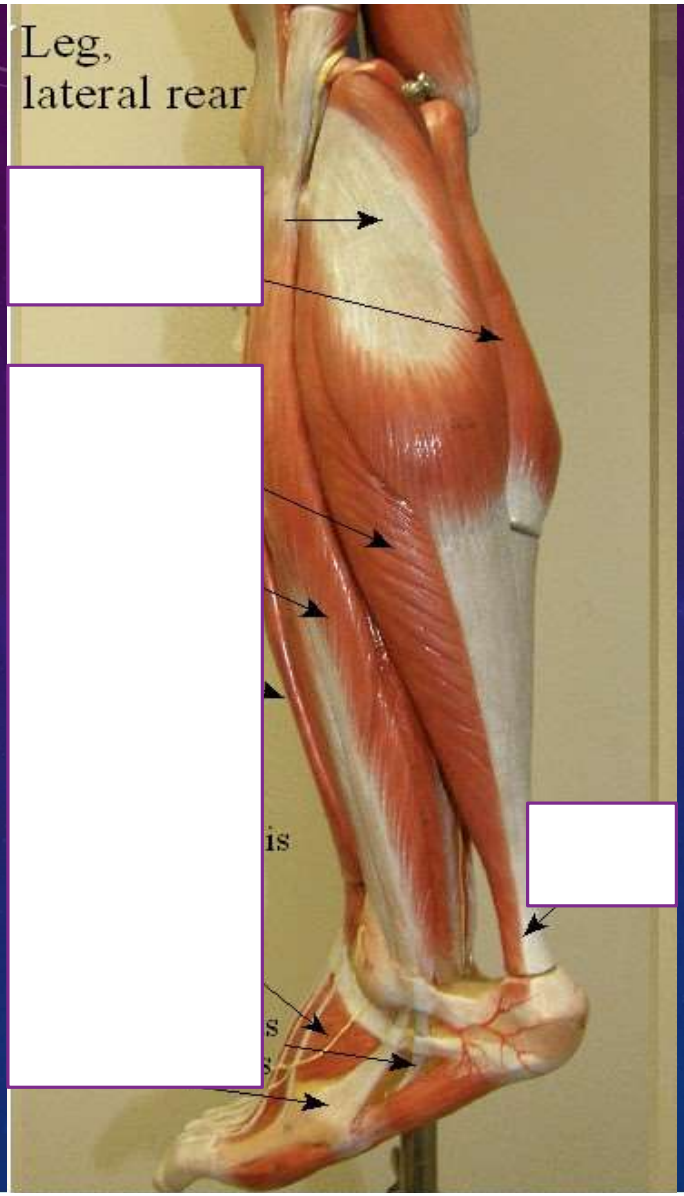
*click to the next slide to check your answer

Extensor digitorum longus

Action: Extension of digits (toes) and dorsiflexion at ankle

*click to the next slide to check your answer

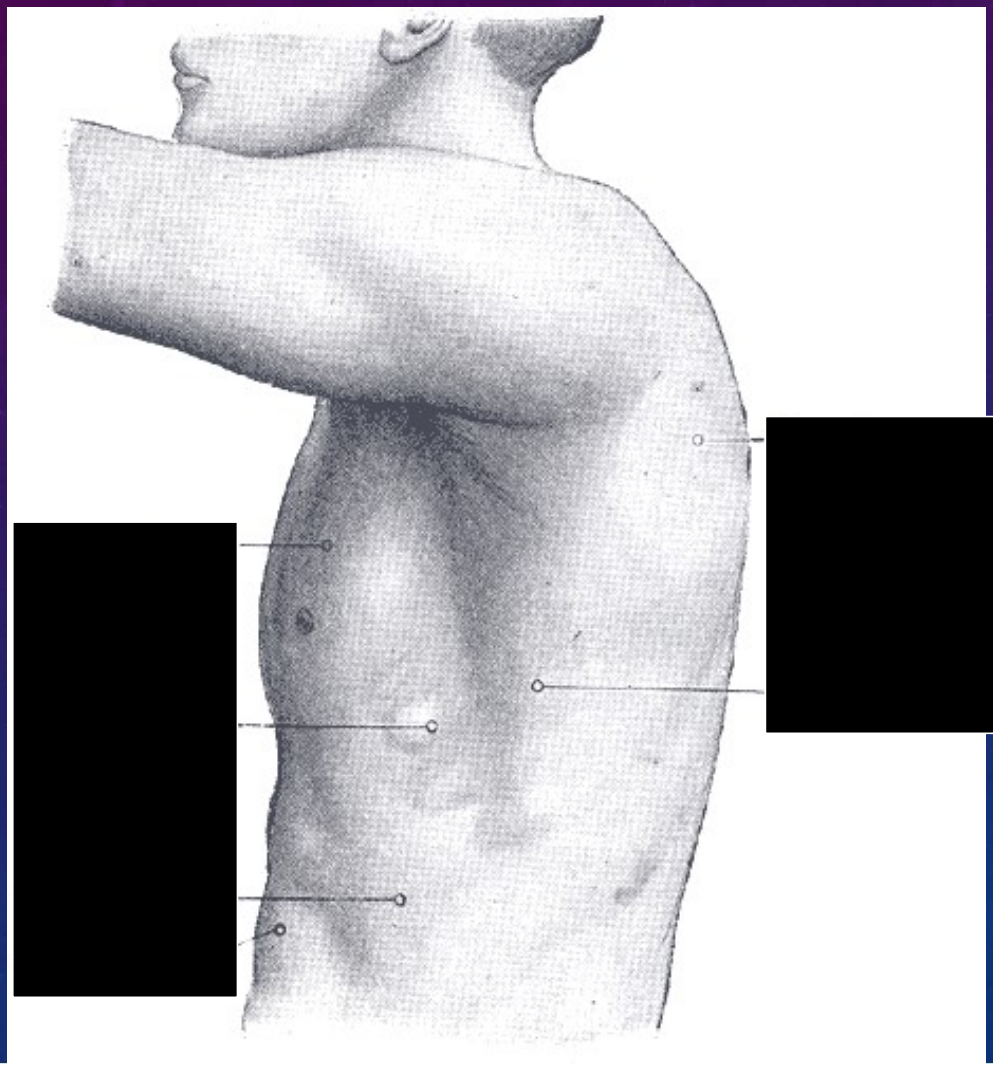
Action: Plantar flexion at ankle; helps with knee flexion

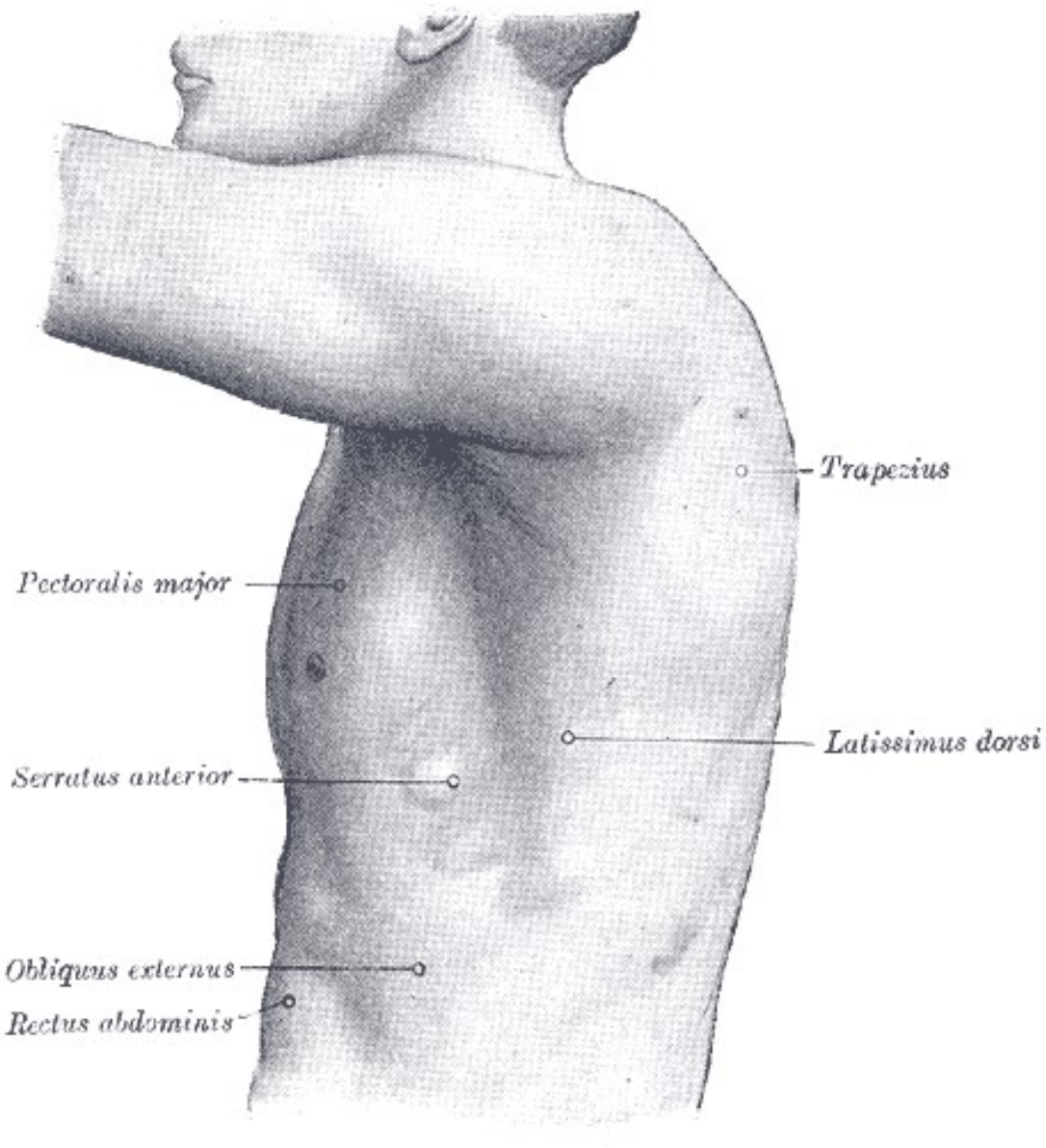

Leg,
lateral rear

Erector spinae


40


10
15




Trapezius
Pectoralis major
Latissimus dorsi
Serratus anterior
Obliquus externus
Rectus abdominis


4
5
6
1
2
3

1

2

- 3
- 4
- 5
- 6
- 7

1scm

2 pectoral major

- 3 deltoid
- 4 biceps brachii
- 5brachioradialis

- 6 gluteus maximus

- 7bicep femoris

Sartorius

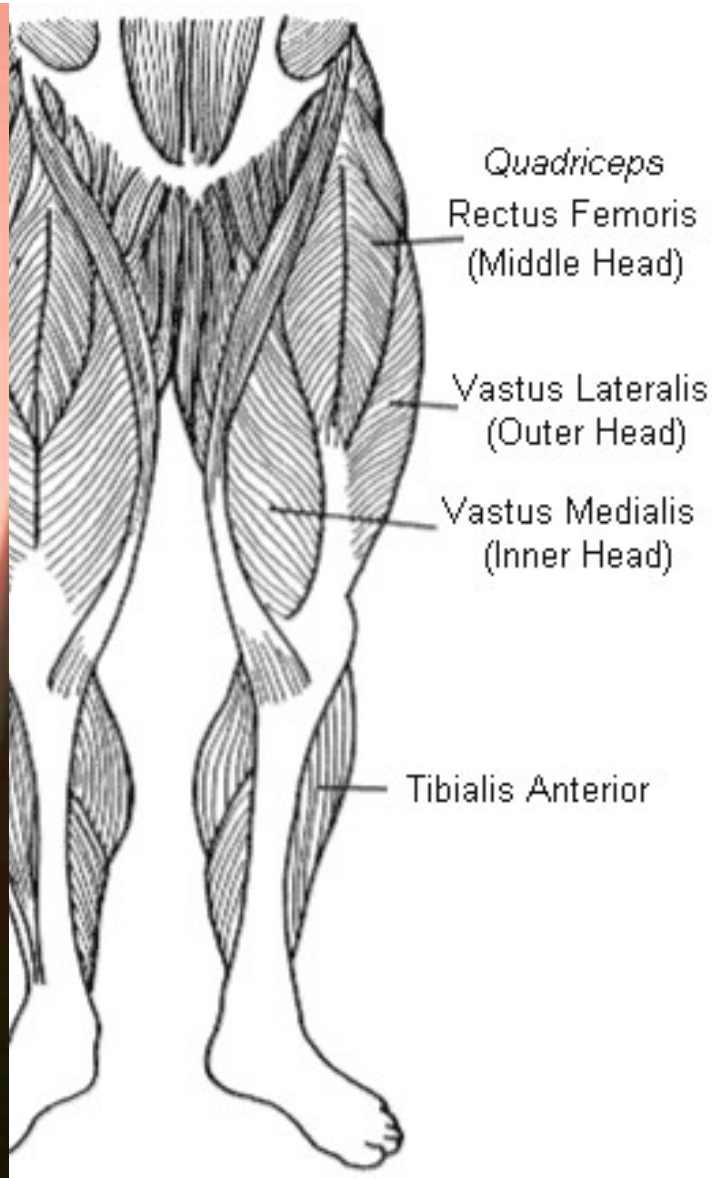
Gastrocnemius

Tibial anterior

Brachioradialis

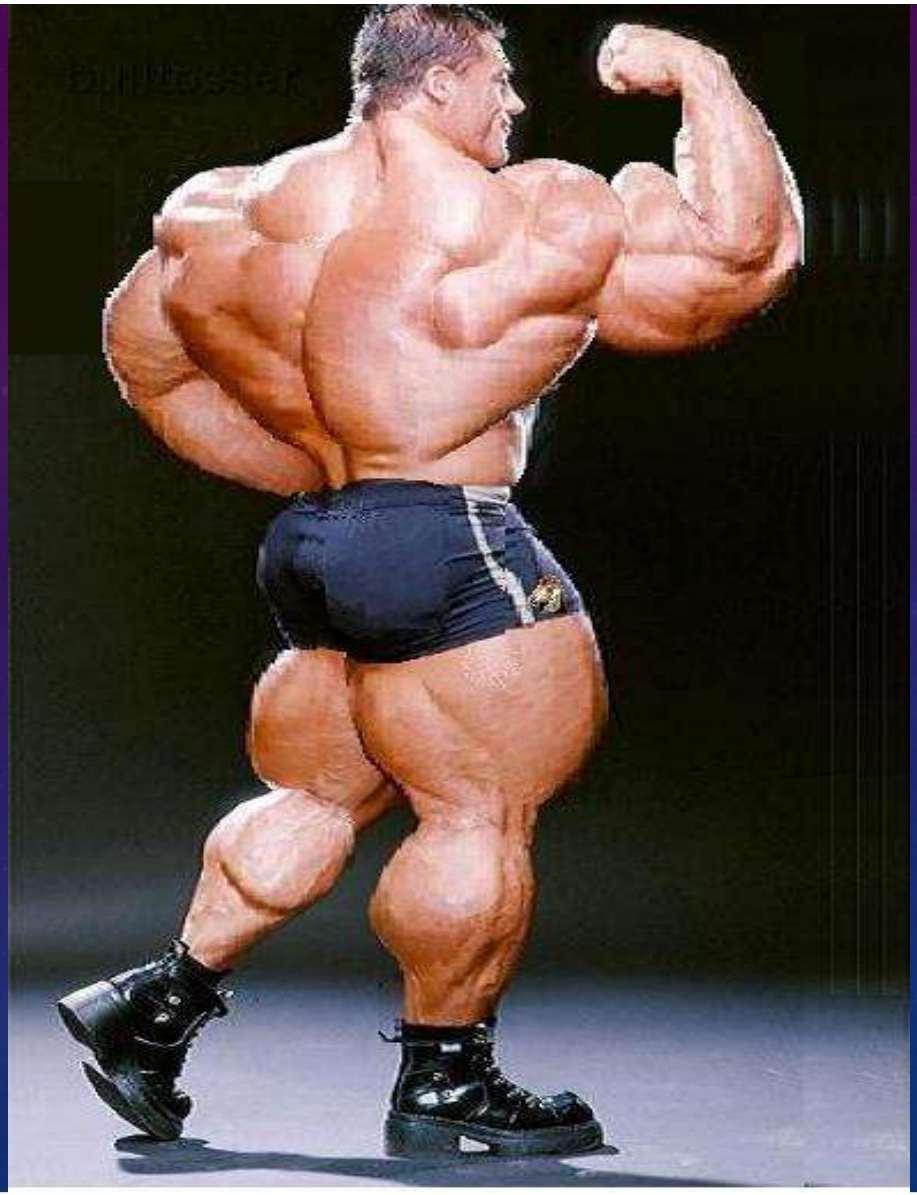
Semitendinous

Gastrocnemius


Quadriceps
Rectus Femoris
(Middle Head)
Vastus Lateralis
(Outer Head)
Vastus Medialis
(Inner Head)
Tibialis Anterior

- Deltoid
- trapezius

GUESS THE ANSWERS NOW YOU KNOW BETTER

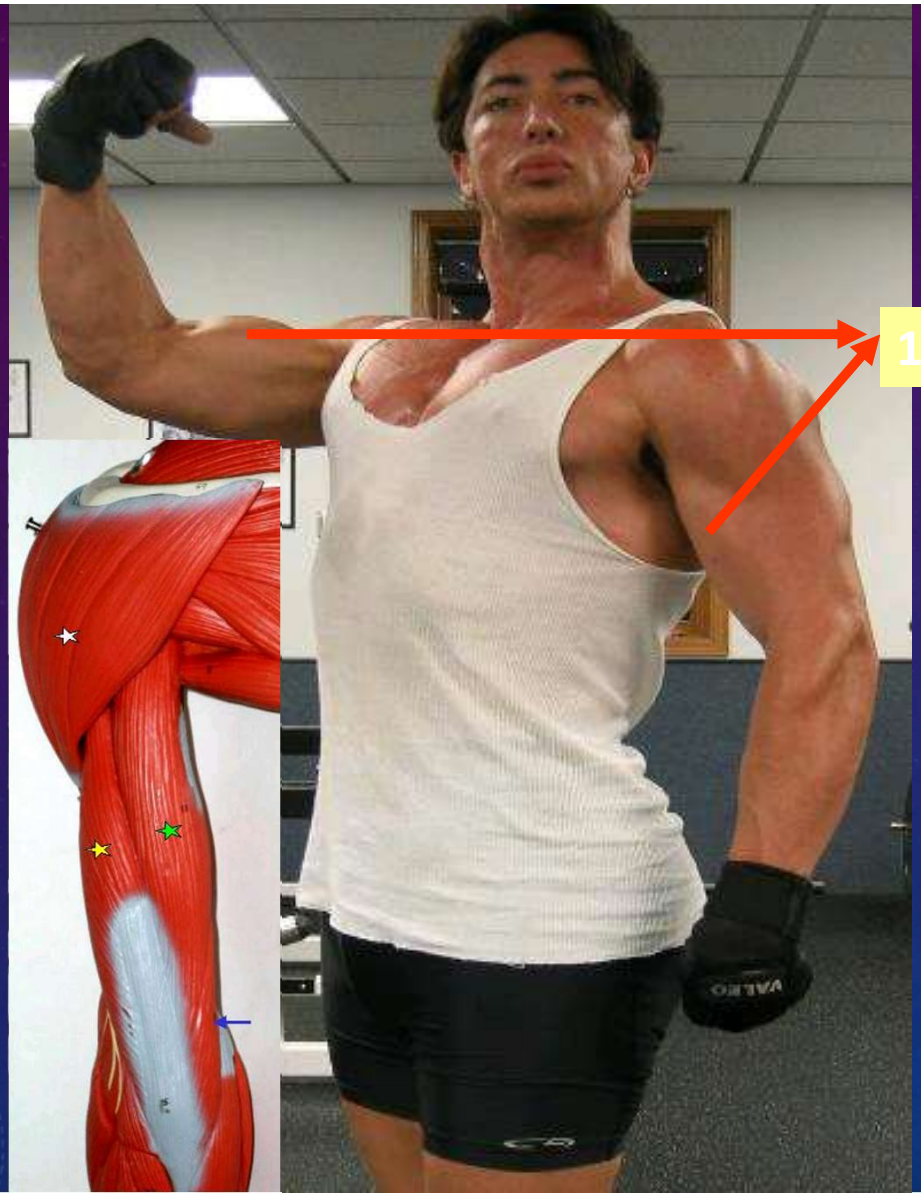


42/IDENTIFY THIS MUSCLE
#1

43/IDENTIFY THIS MUSCLE:

1

44/IDENTIFY THIS MUSCLE #1

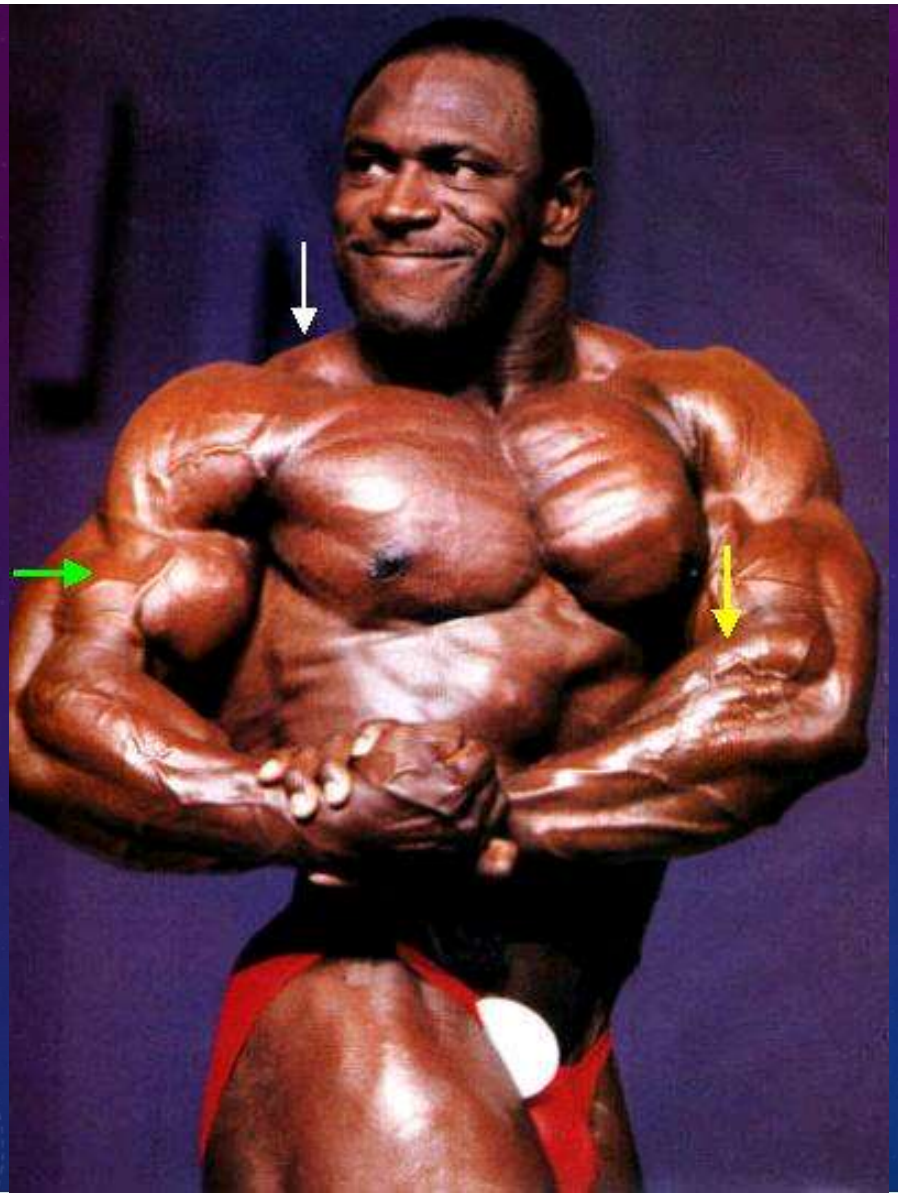


45/IDENTIFY THIS MUSCLE

46/DETERMINE THE INSERTION AND ORIGIN

47/DETERMINE ITS FUNCTION:

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



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

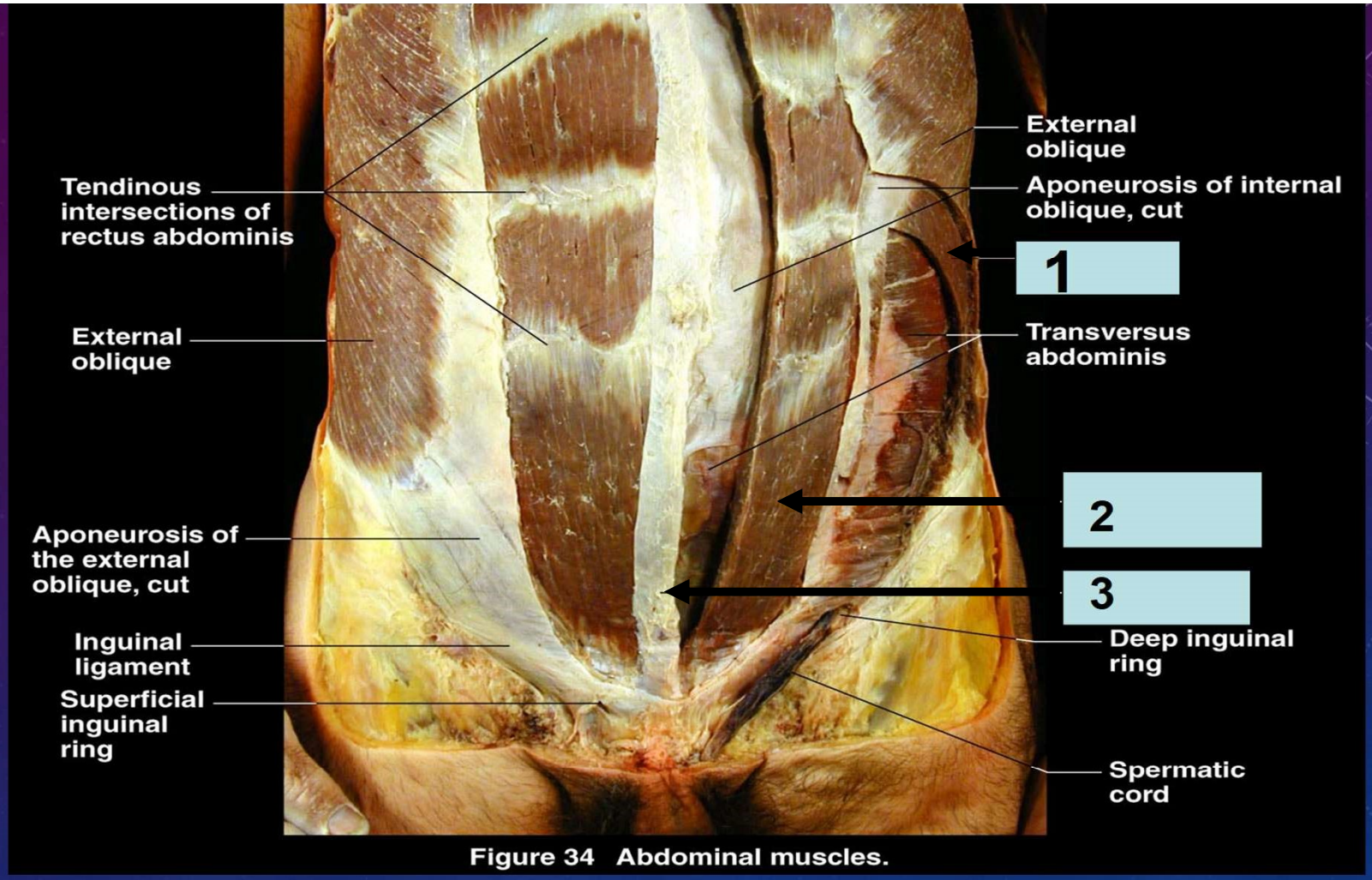


Figure 34 Abdominal muscles.

51/Identify muscle 1

52/Identify muscle 2

53/Identify structure 3

55/IDENTIFY MUSCLE 1

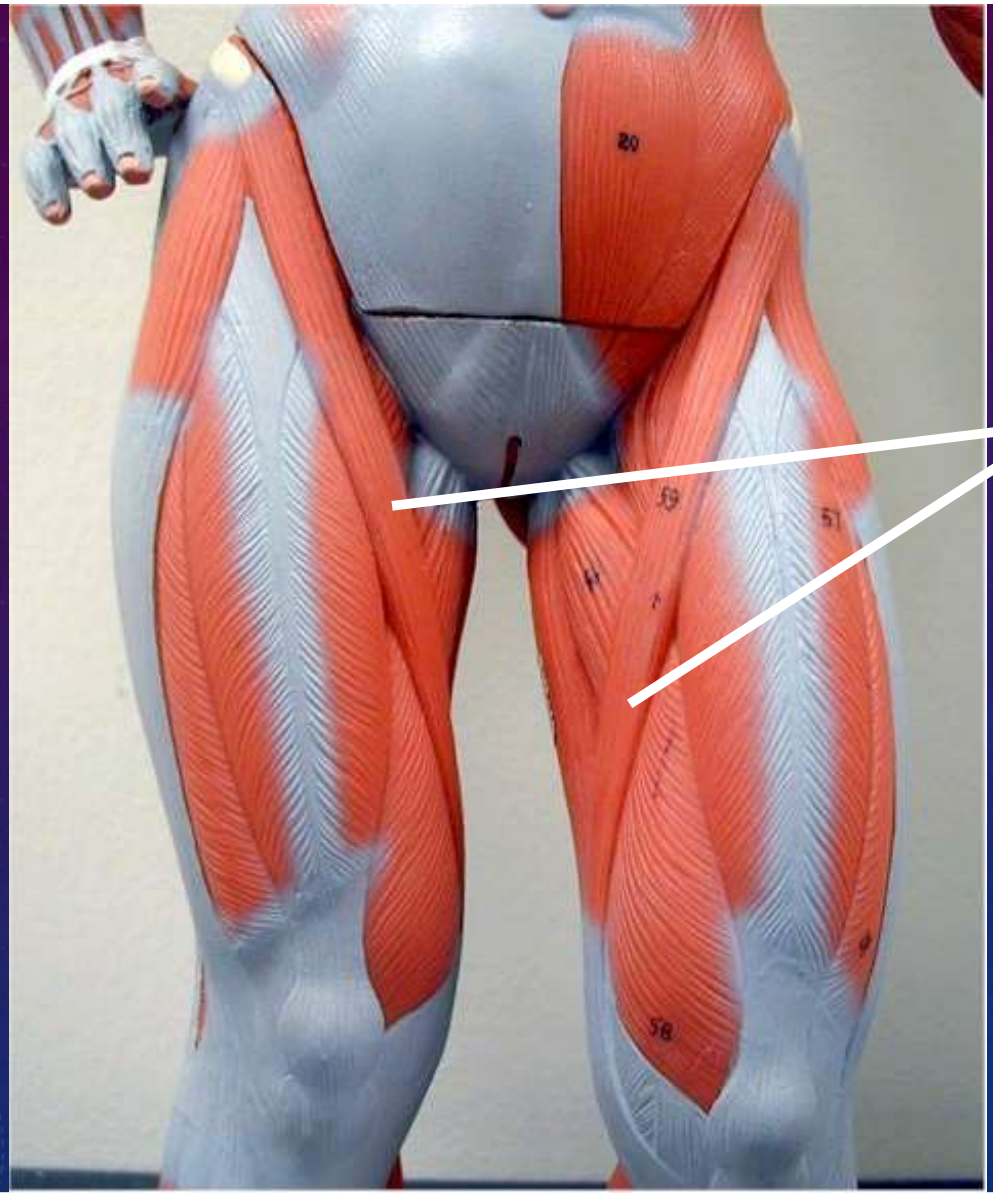
56/IDENTIFY MUSCLE 2

57/IDENTIFY MUSCLE 3

58/IDENTIFY 1

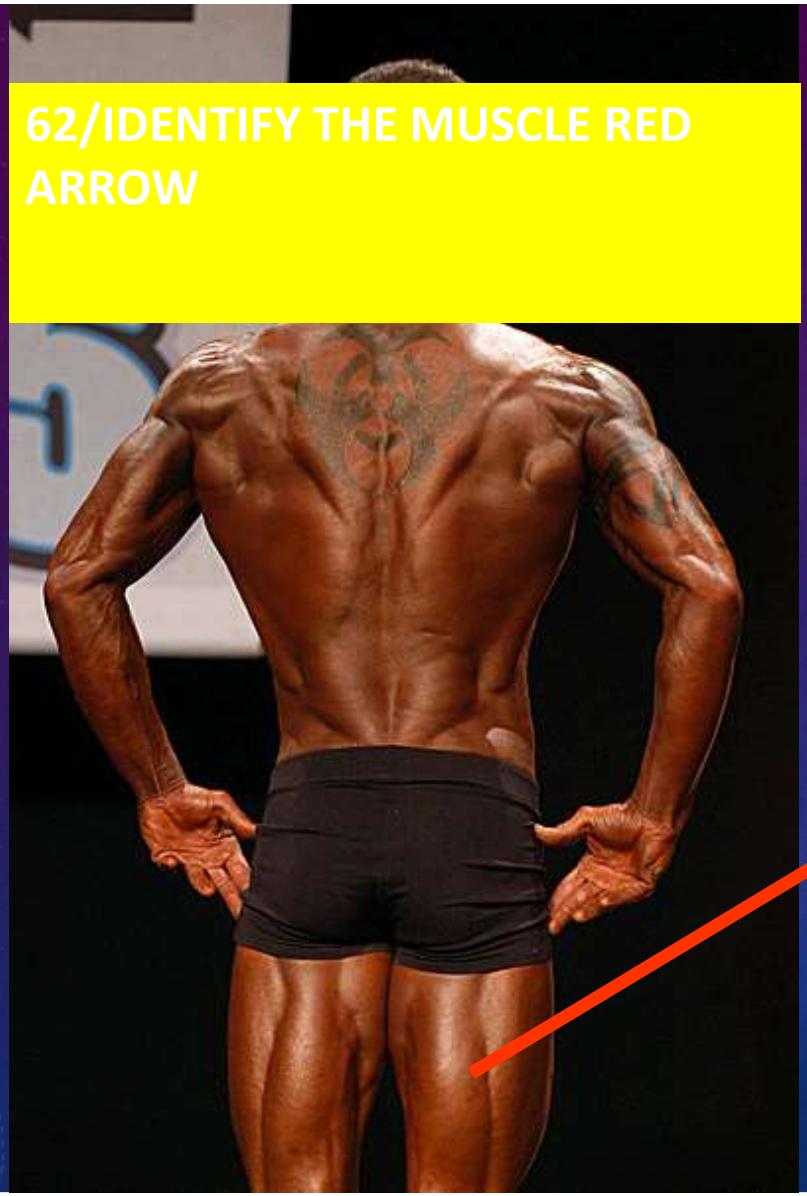
59/IDENTIFY 2

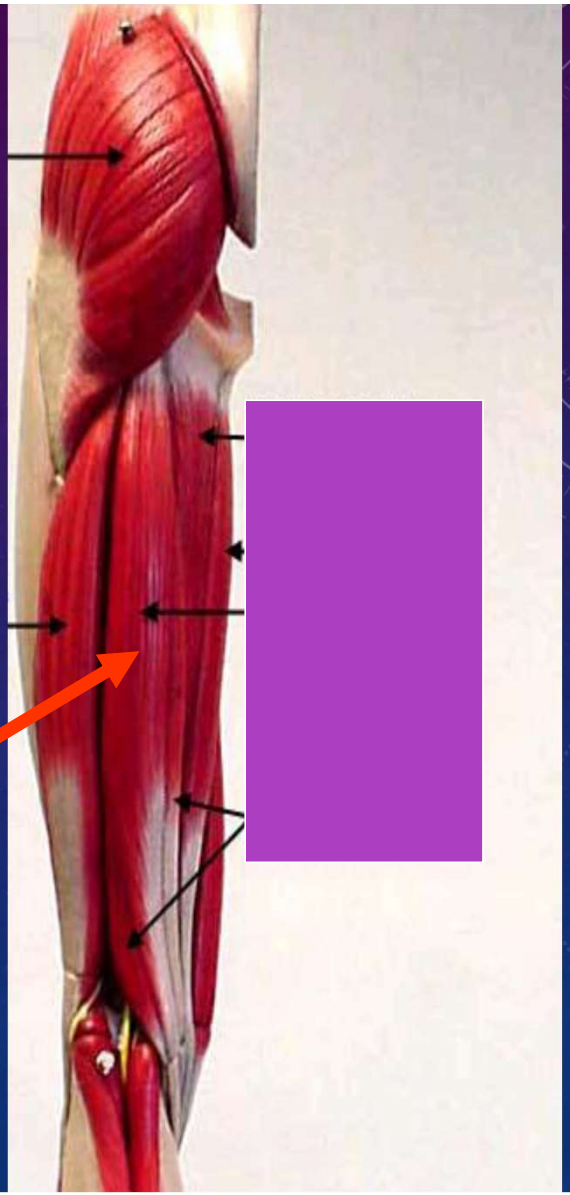
60/IDENTIFY THE WHITE ARROW MUSCLES



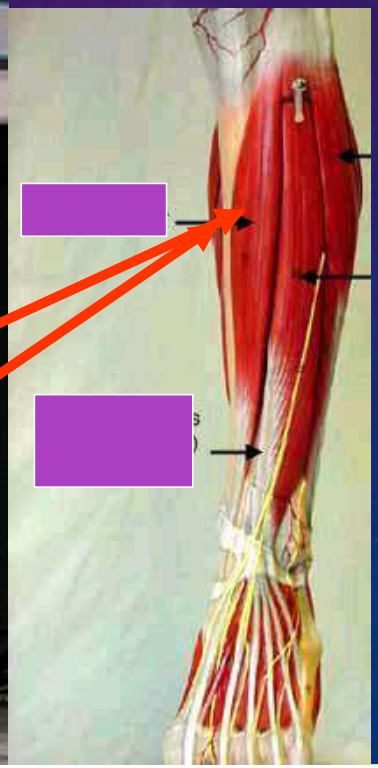
61/ Identify this muscle #1

62/IDENTIFY THE MUSCLE RED ARROW



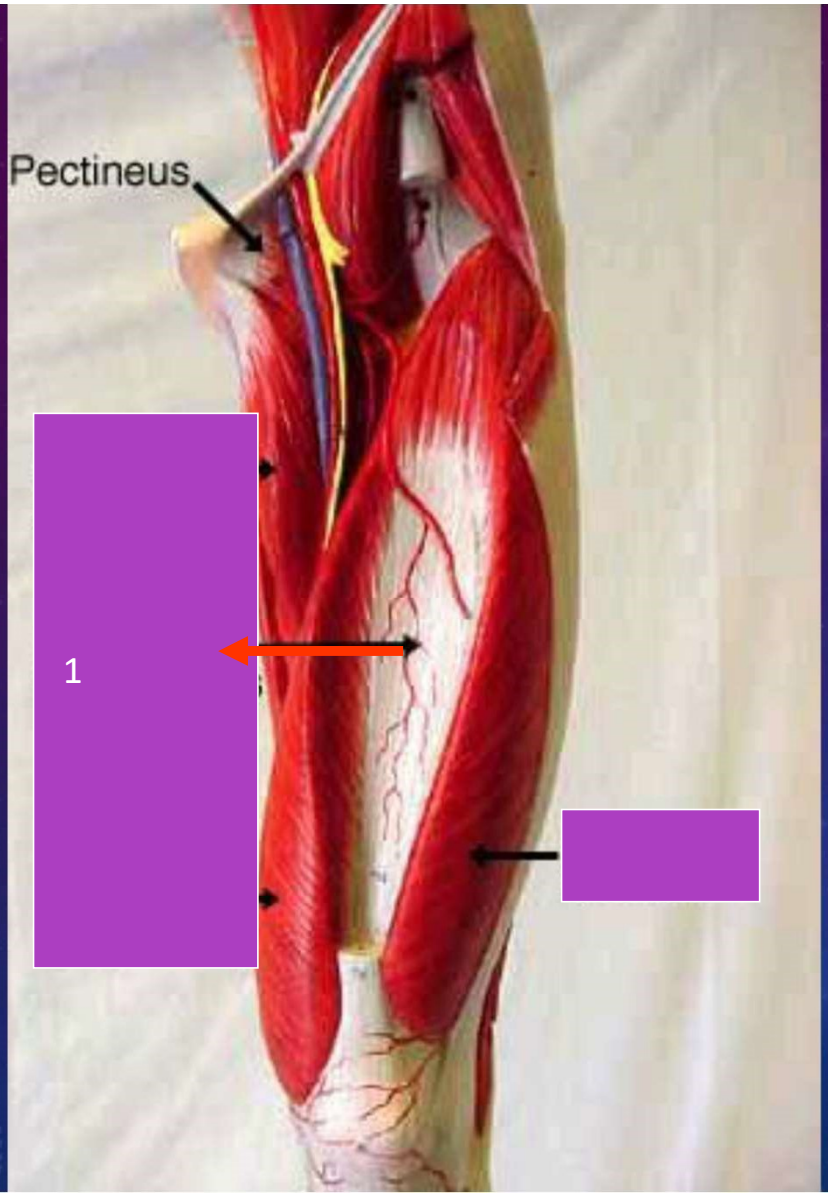


63/IDENTIFY THE MUSCLE RED ARROW



64/IDENTIFY THE MUSCLE RED ARROW

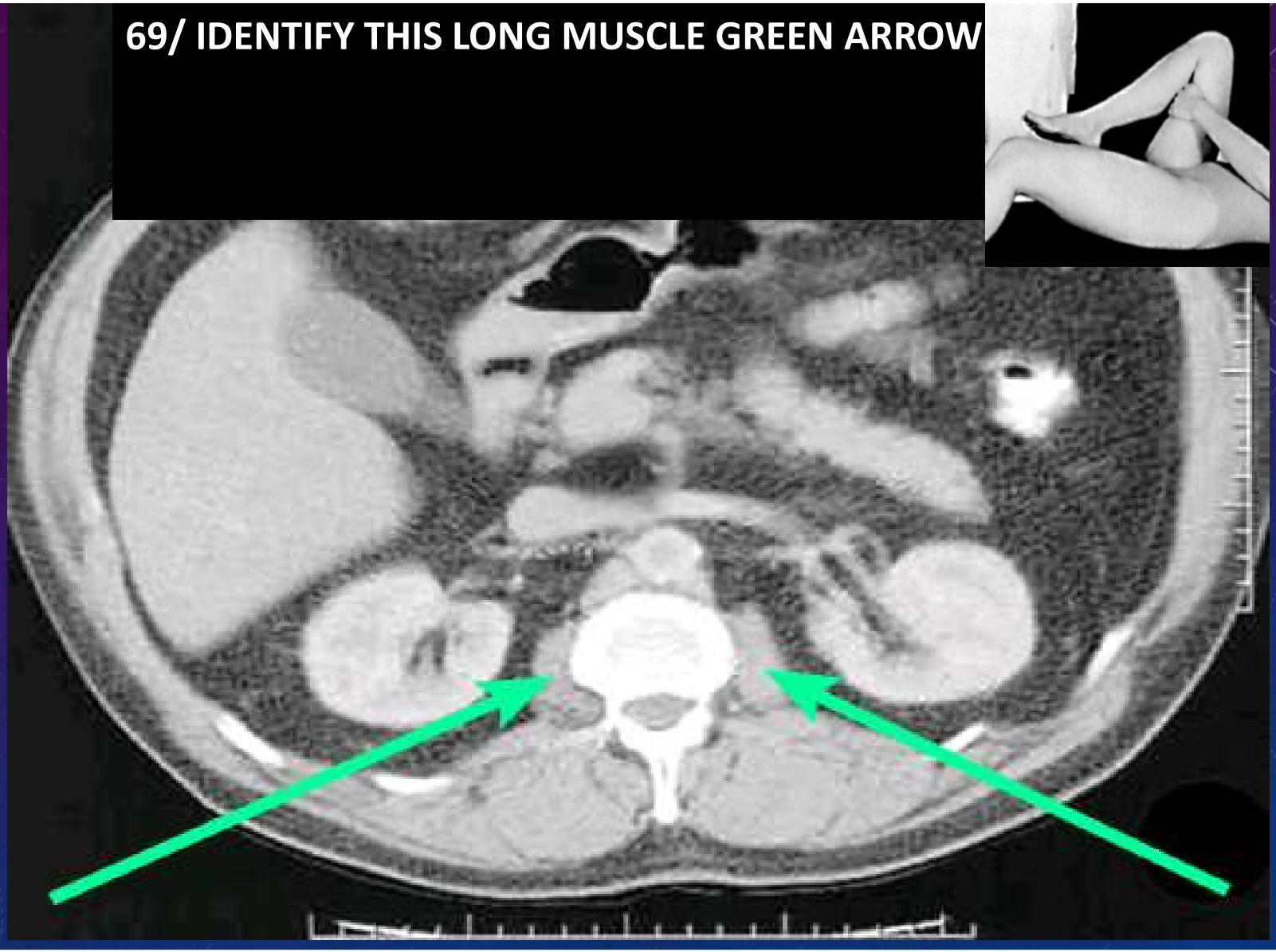
65/ WHAT DO YOU CALL THE INCREASE OF THE SIZE OF THE MUSCLES AS SHOW ON THIS PICTURE?



67/THIS DEEP MUSCLE OF THE TIGH NEED TO BE IDENTIFIED

68/IDENTIFY THESE LATERAL MUSCLES

69/ IDENTIFY THIS LONG MUSCLE GREEN ARROW



GENERAL REVIEW FINAL

HEAD AND NECK MUSCLES

- There are two main groups of head muscles?.

HEAD AND NECK MUSCLES

- There are two main groups of head muscles.
  - Facial muscles
    - Inserted into soft tissues
    - Pull on the skin of the face
  - Chewing muscles
    - Responsible for breaking down the foods we eat

FRONTALIS MUSCLE - FACIAL

- Originates at the cranial aponeurosis and inserts to the skin of the eyebrows.
- Raises your eyebrows.
- Wrinkles your forehead

ORBICULARIS OCULI - FACIAL

- Fibers run circles around the eyes.
- Allows you to close your eyes, squint, blink, and wink.

ORBICULARIS ORIS

- Fibers run circles around the mouth.
- Closes the mouth and protrudes the lips
- Often called the “kissing” muscle.

BUCCINATOR – FACIAL AND CHEWING

- Runs horizontally across the cheek and inserts into the orbicularis oris.
- Flattens the cheek (whistling or blowing a trumpet).
- Compresses the cheek to hold the food between the teeth during chewing.

ZYGOMATICUS - FACIAL

- Extends from the corner of the mouth to the cheekbone.
- Called the smiling muscle because it raises the corners of the mouth upward.

MASSETER – CHEWING

- Covers the angle of the lower jaw.
- Runs from the zygomatic process of the temporal bone to the mandible.
- Closes the jaw by elevating the mandible.

TEMPORALIS – CHEWING

- Fan-shaped muscle overlying the temporal bone.
- Inserts into the mandible.
- Acts as synergist of the masseter in closing the jaw.

PLATYSMA – NECK

- Sheetlike muscle that covers the anterolateral neck
- Originates from the connective tissue covering of the chest
- Inserts into the area of the mouth.
- Pulls on the corners of the mouth to produce a downward sag.

STERNOCLEIDOMASTOID – NECK

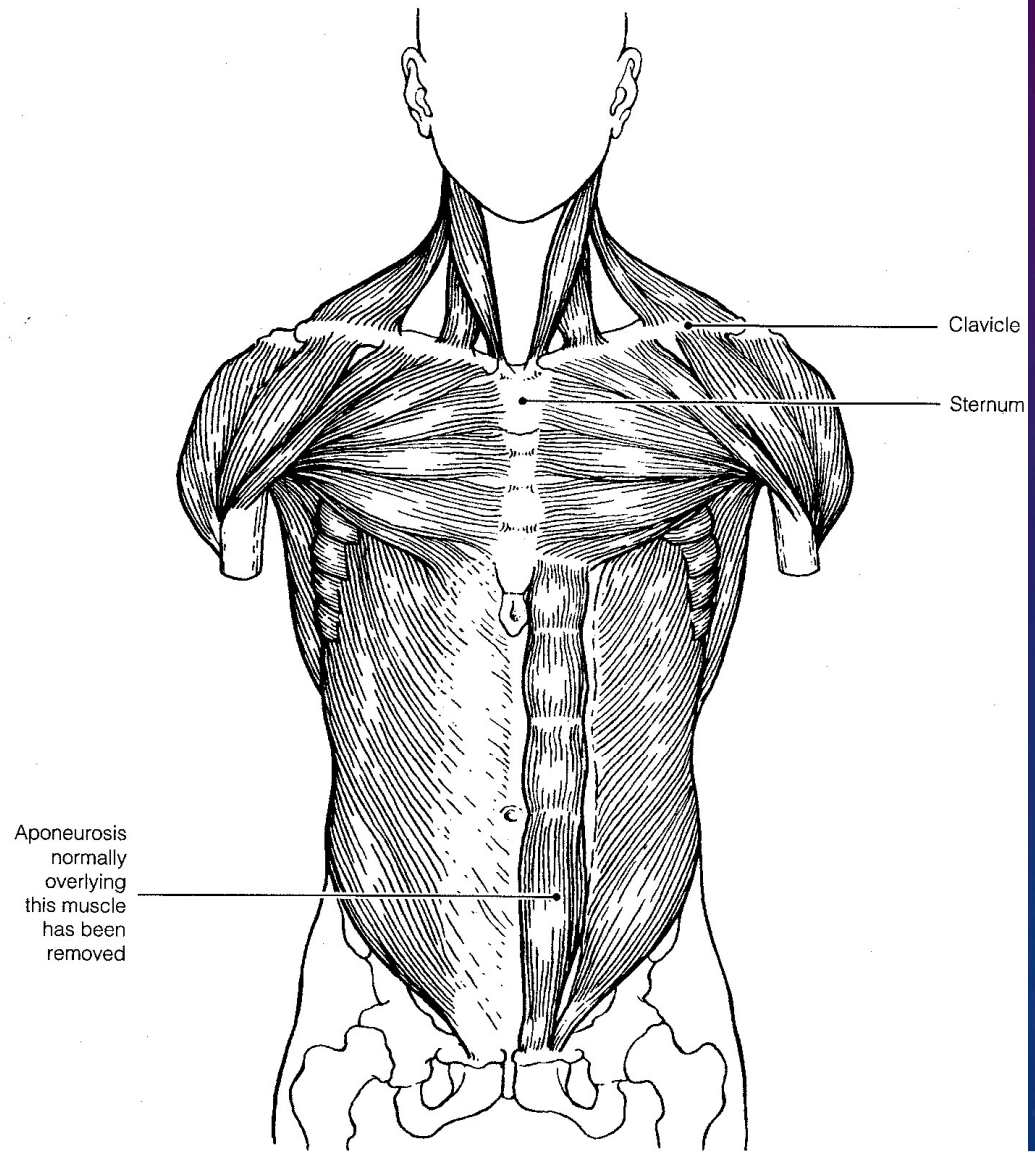
- Two-headed paired muscle.
- One head originates at the sternum and the second head originates at the clavicle.
- Heads fuse before inserting into the mastoid process of the temporal bone.
- When both are contracted, they flex the neck (often called the prayer muscle).
- When one contracts, it turns the head the opposite direction.

TRUNK MUSCLES

1. Those that move the vertebral column
2. Anterior thorax muscles (moving the ribs, head, and arms)
3. Abdominal wall (also move the vertebral column and form the natural girdle of the abdominal wall).

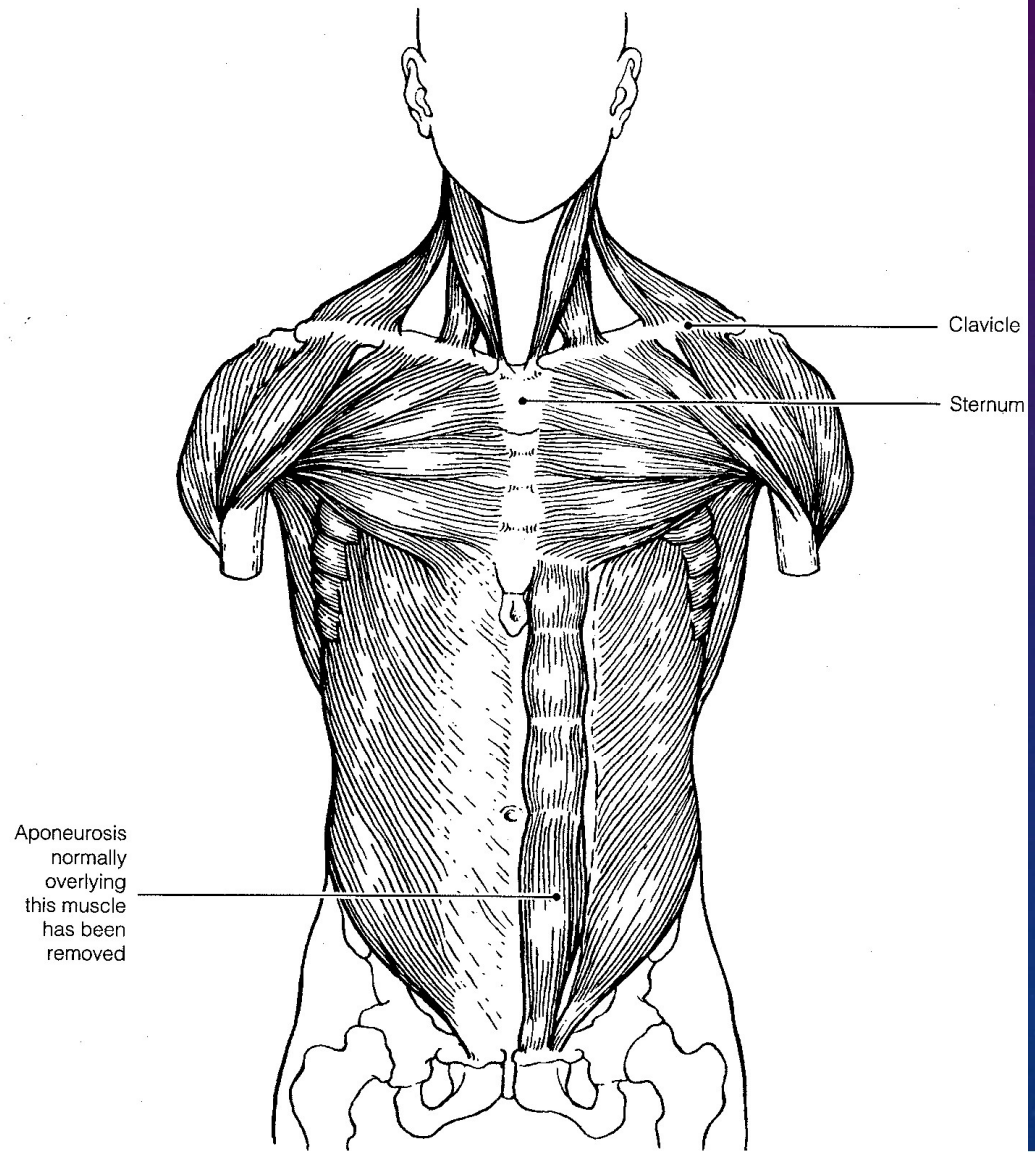
ANTERIOR THORAX (CONT.)

- Pectoralis Major
  - Large fan-shaped muscle covering the upper part of the chest.
  - Origin is from the shoulder girdle and the first six ribs
  - Inserts on the proximal end of the humerus
  - Acts to adduct and flex the arm.


Clavicle
Sternum
Aponeurosis normally overlying this muscle has been removed

ANTERIOR THORAX (CONT.)

- Deltoid
  - Triangular shaped the forms the rounded shape of your shoulders.
  - Favorite injection site (less than 5mL).
  - Originates at the scapular spine and clavicle.
  - Inserts into the proximal humerus.
  - Prime mover of arm abduction.


Clavicle
Sternum
Aponeurosis normally overlying this muscle has been removed

ANTERIOR THORAX (CONT.)

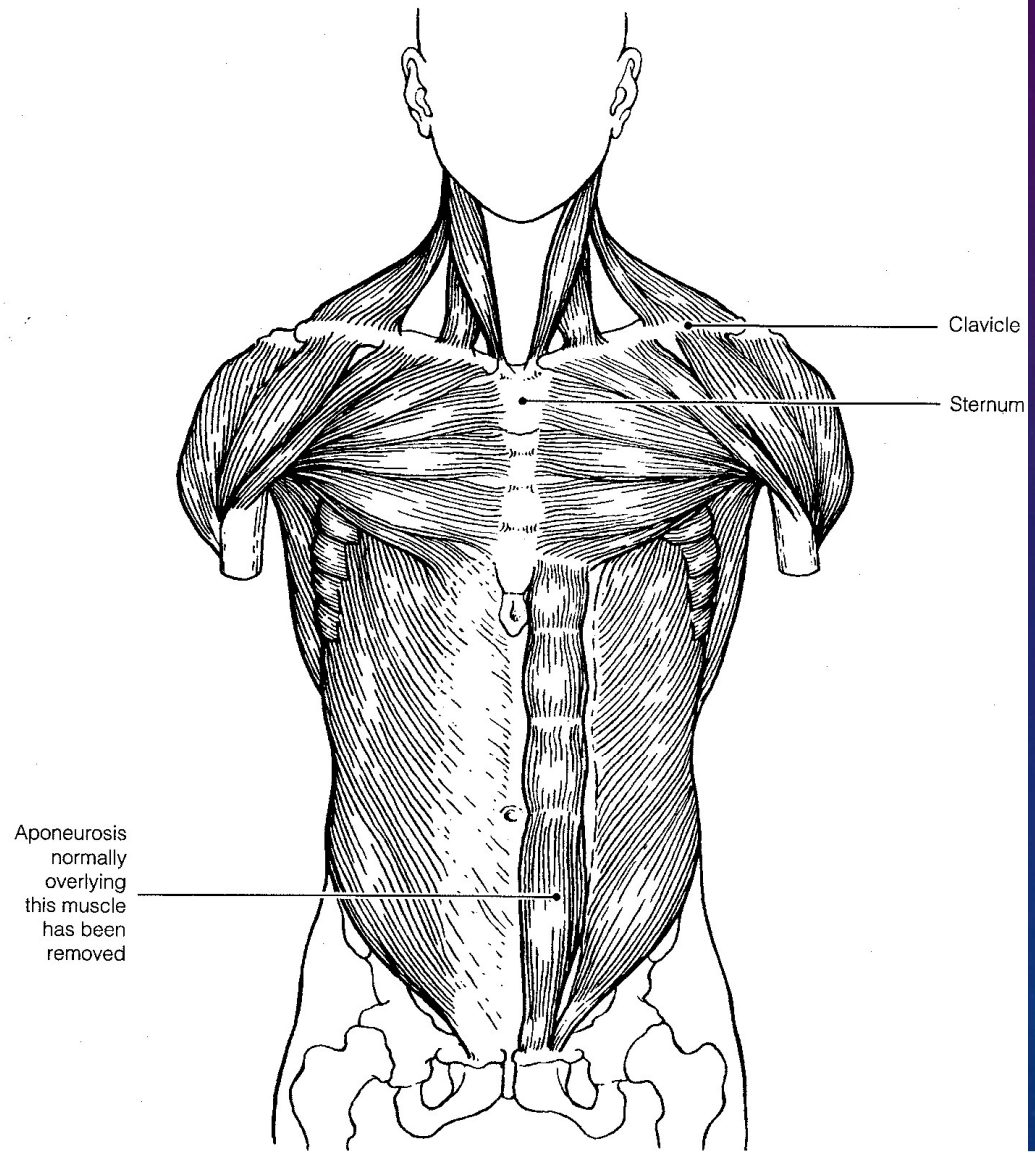
- Intercostal Muscles
  - Deep muscles between the ribs.
  - External intercostals responsible for raise the rib cage for breathing air in.
  - Internal intercostals, deep to the externals, depress the rib cage to move air out.

ANTERIOR THORAX (CONT.)

- Diaphragm
  - Single thin dome-shaped muscle.
  - Separates the thoracic cavity from the abdominal cavity.
  - Primary muscle of inspiration

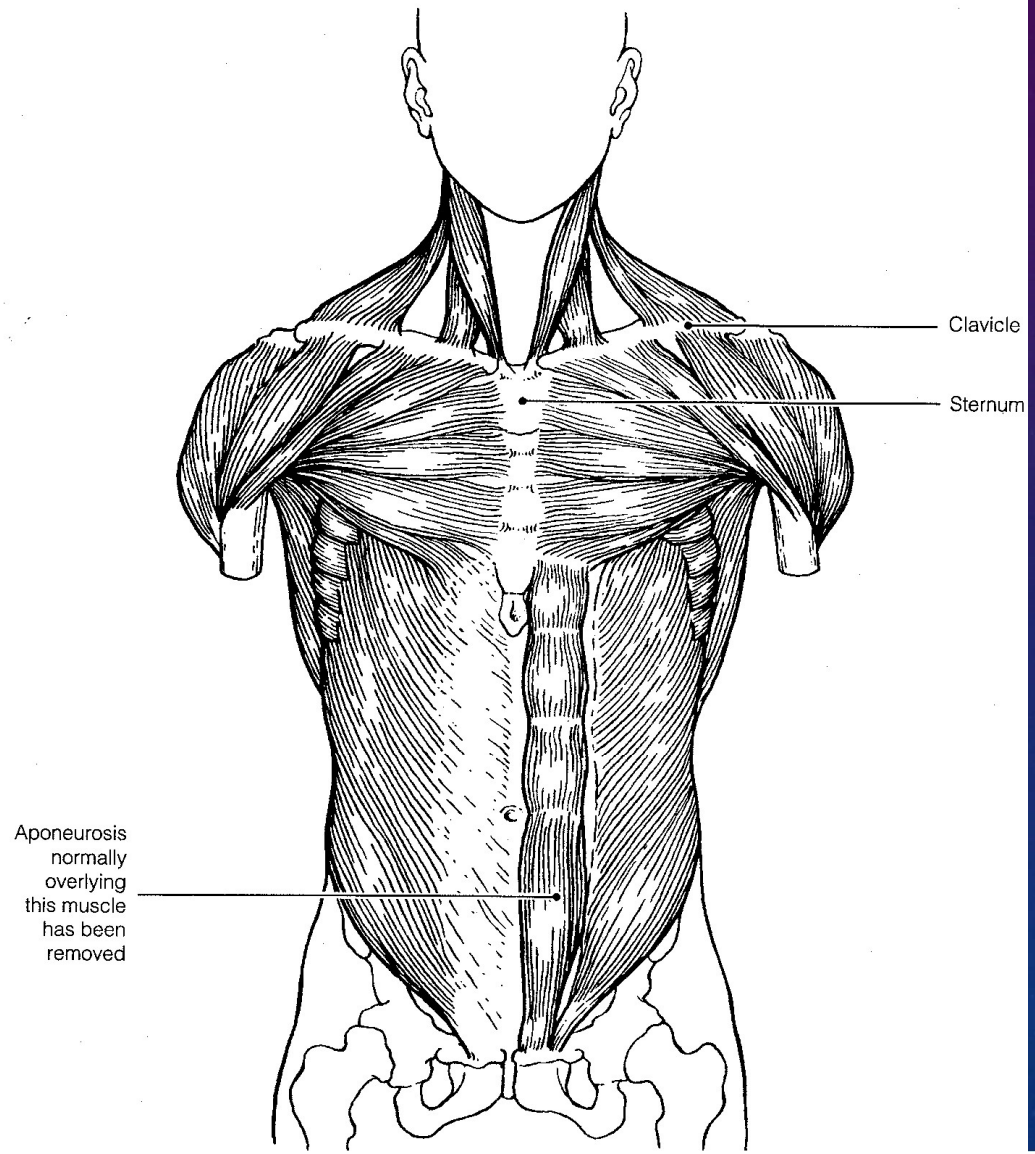
ANTERIOR THORAX – ABDOMINAL GIRDLE

- Rectus abdominis
  - Paired straplike muscle
  - Most superficial of abdominal muscles
  - Run from the pubis to the rib cage
  - Main function is to flex the vertebral column.
  - They also compress the abdominal contents during defecation and childbirth.


Clavicle
Sternum
Aponeurosis normally overlying this muscle has been removed

ANTERIOR THORAX – ABDOMINAL GIRDLE (CONT.)

- **External Oblique**
  - Paired superficial muscle that make up the lateral walls of the abdomen.
  - Fibers run downward and medially form the last eight ribs and insert into the ilium.
  - Flex the vertebral column, but also rotate the trunk and bend laterally.


Clavicle
Sternum
Aponeurosis normally overlying this muscle has been removed

ANTERIOR THORAX – ABDOMINAL GIRDLE (CONT.)

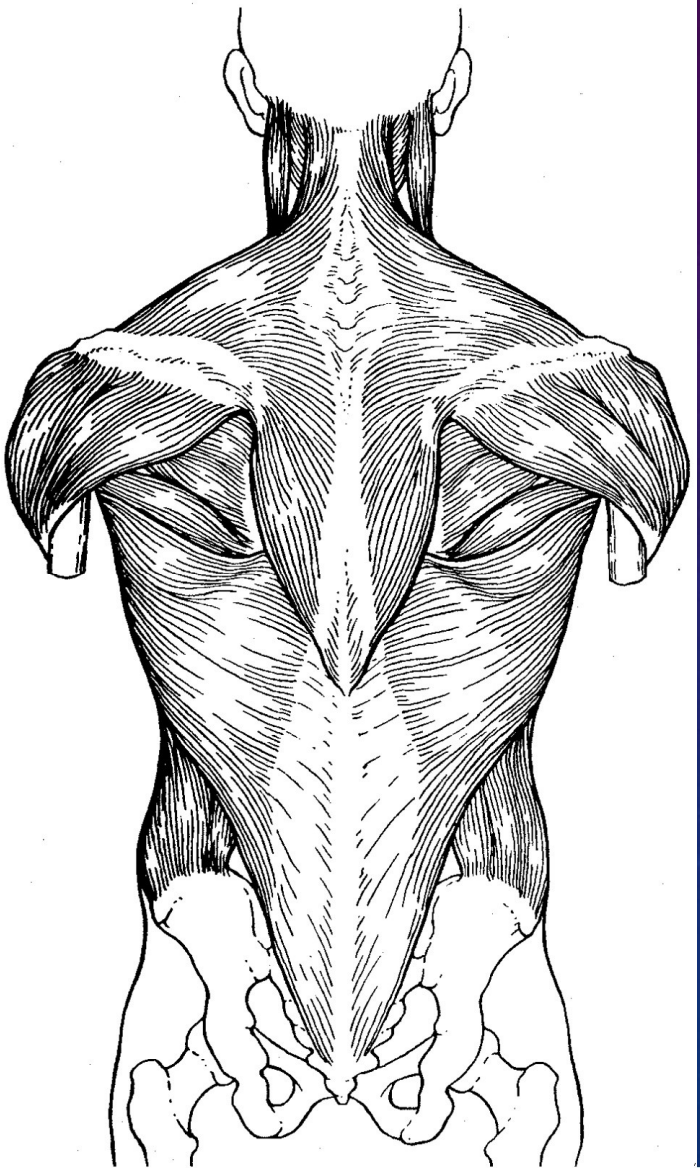
- **Internal Oblique**
  - Paired muscle deep to the external oblique.
  - Fibers run at right angles to external obliques.
  - Originate from the iliac crest and insert into the last three ribs.
  - Functions are same as the external obliques

ANTERIOR THORAX – ABDOMINAL GIRDLE (CONT.)

- Transversus abdominis
  - Deepest muscle of the abdominal wall.
  - Fibers run horizontally across the abdomen.
  - Originates from the lower ribs and iliac crest and inserts into the pubis.
  - Function to compress the abdominal contents.

POSTERIOR THORAX

- Deltoid
  - Triangular shaped the forms the rounded shape of your shoulders.
  - Favorite injection site (less than 5mL).
  - Originates at the scapular spine and clavicle.
  - Inserts into the proximal humerus.
  - Prime mover of arm abduction.

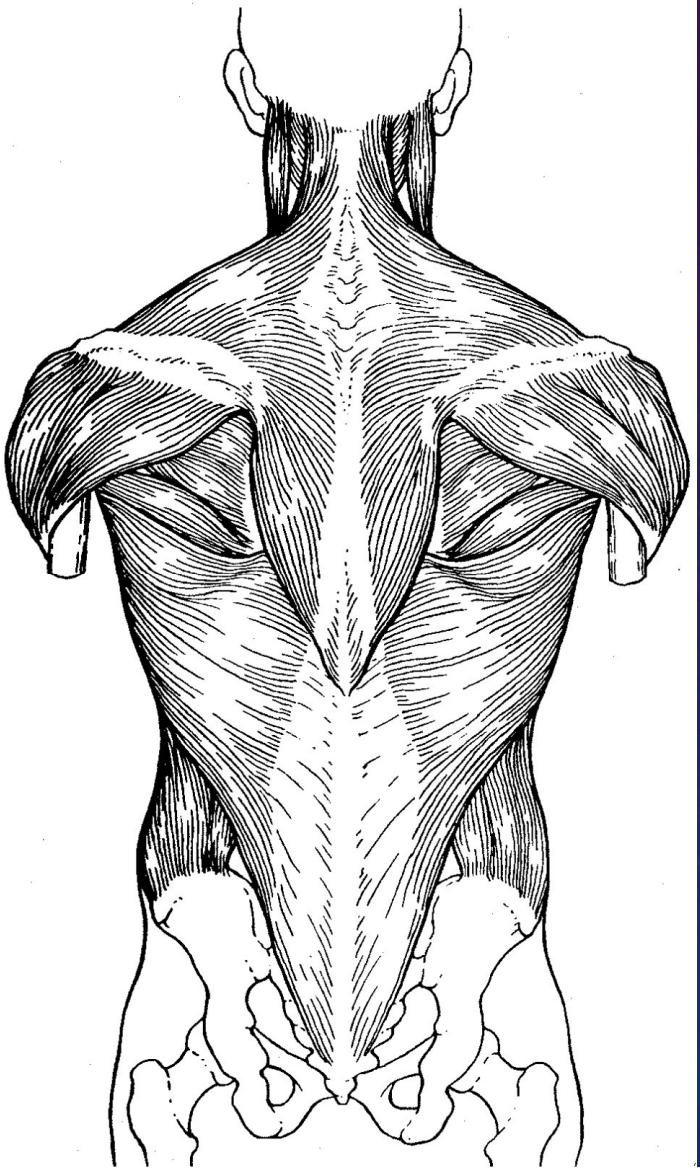


POSTERIOR THORAX (CONT.)

- Trapezius
  - Most superficial muscles of the posterior neck and upper trunk.
  - Together, they are diamond- or kite-shaped.
  - Both originate at the occipital bone and insert to the end of the thoracic vertebrae.
  - (CONTINUED ON THE NEXT SLIDE)

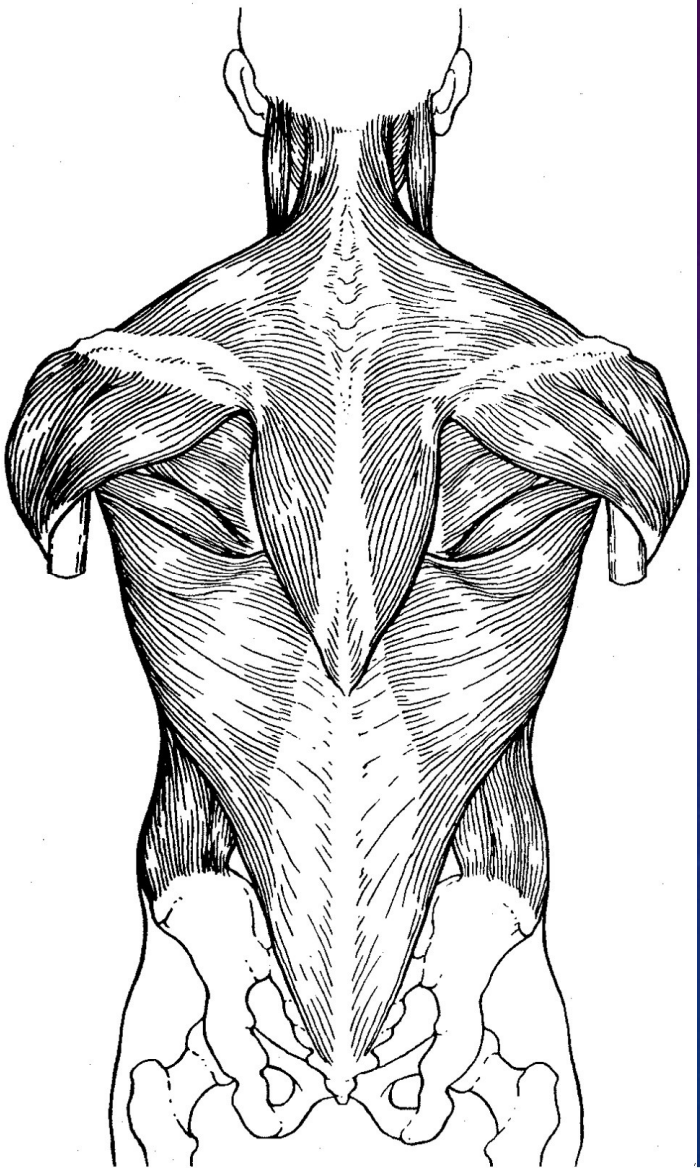
POSTERIOR THORAX (CONT.)

- Trapezius (cont.)
  - They flare laterally to insert on the scapular spine and clavicle.
  - They extend the head and can also elevate, depress, adduct, and stabilize the scapula (antagonist of sternocleidomastoids).



POSTERIOR THORAX (CONT.)

- Latissimus Dorsi
  - Large flat muscle pair the covers the lower back.
  - Originates on the lower spine and ilium and sweeps upward to insert on the proximal humerus.
  - Extends and adducts the humerus.
  - Powerful muscle for swimmers on the power stroke.



POSTERIOR THORAX (CONT.)

- Erector Spinae
  - Group of three deep back muscles resembling columns along the spine.
  - Prime mover of back extension.
  - Also provide resistance that helps control the action of bending over at the waist.
  - When in spasm, represent a common source of low back pain.

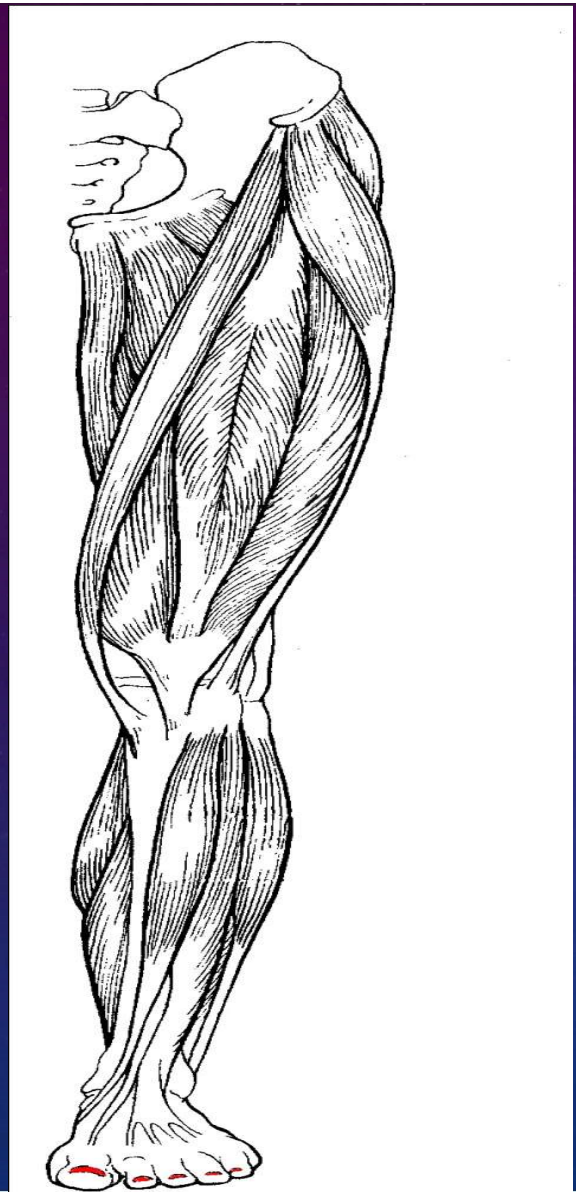
ENDS MATERIAL FOR QUIZ 6.3

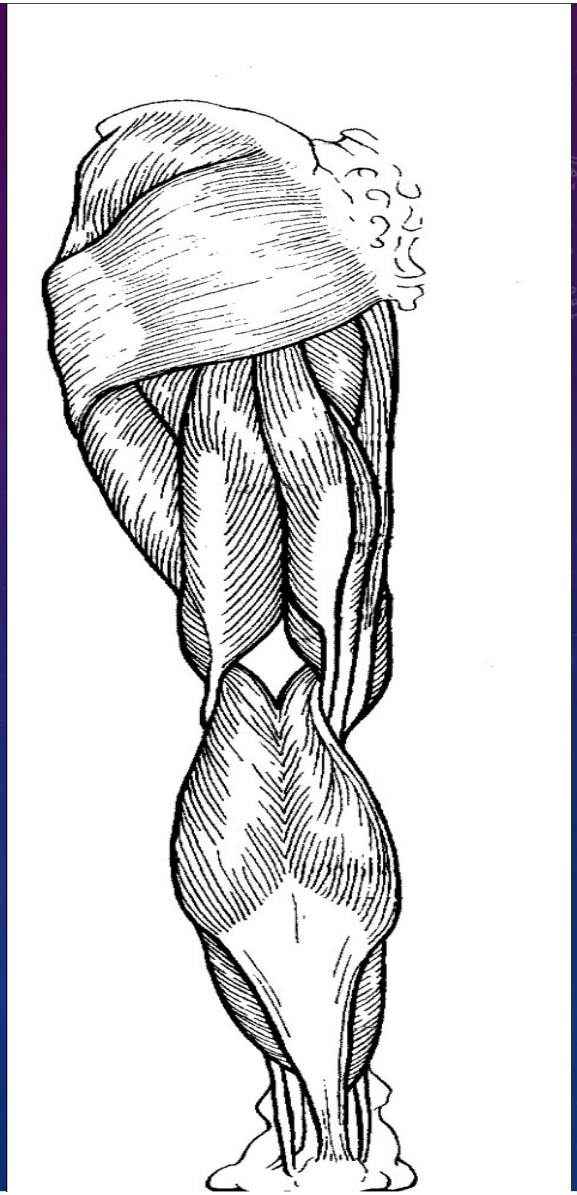
MUSCLES OF THE HIP, THIGH, AND LEG

12 NOTECARDS + 5 SAMPLE QUESTIONS

MUSCLES OF THE HIP, THIGH, AND LEG

- **Gluteus Maximus**
  - Large superficial muscle of the hip.
  - Originates from the sacrum and iliac bones and inserts on the gluteal tuberosity of the femur.
  - Powerful hip extensor that brings the thigh in a straight line with the pelvis.
  - Used when climbing stairs and jumping.





MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Gluteus Medius
  - Runs from the ilium to the femur under the gluteus maximus
  - It is a hip abductor and important in steadying the pelvis while walking.
  - Site for IM injections more than 5mL.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Iliopsoas
  - Originates at the iliac bone and lower vertebrae deep in the pelvis and inserts on the lesser trochanter of the femur.
  - Prime mover of hip flexion.
  - Acts to keep the upper torso from bending backward.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Adductor muscles (or group)
  - Originate on the pelvis and insert on the proximal aspect of the femur.
  - Form the muscle mass on the medial aspect of the thigh.
  - They adduct the thigh (press the thighs together).
  - They tend to become flabby very easily.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Hamstring group (3 muscles)
  - Biceps femoris
  - Semimembranosus
  - Semitendinosus
- Originate on the ischial tuberosity.
- Insert on both sides of the proximal tibia.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- **Sartorius**
  - Thin, straplike muscle that is not very important.
  - Most superficial muscle of the thigh.
  - Runs obliquely across the thigh from the anterior iliac crest to the medial side of the tibia.
  - Is a weak thigh flexor.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Quadriceps group (4 muscles)
  - Rectus femoris
  - 3 vastus muscles
- Vastus muscles originate from the femur while the rectus femoris originates on the pelvis.
- (Continued on next slide)

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Quadriceps group (4 muscles) (Cont.)
- All four insert on the tibial tuberosity via the patellar ligament.
- As a whole, act to extend the knee.
- The rectus femoris can also act to flex the hip.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Tibialis anterior.
  - Superficial muscle on the anterior leg.
  - Originates on the proximal tibia and inserts into the tarsal bones by a long tendon.
  - Dorsiflexes and inverts the foot.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Extensor Digitorum Longus
  - Lateral to the tibialis anterior
  - Originates from the lateral tibial condyle and proximal radius and inserts into the phalanges of toes 2-5 via a long tendon.
  - Prime mover of toe extension and a dorsiflexor of the foot.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Fibularis muscles.
  - Originate from the fibula and insert into the metatarsal bones of the foot.
  - Act to plantar flex and evert the foot.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Gastrocnemius
  - Two-bellied muscle of the posterior leg.
  - Originates on each side of the distal femur and insert by calcaneal tendon into the calcaneus.
  - Prime mover for plantar flexion of the foot.
  - Often called the “toe dancers” muscle.

MUSCLES OF THE HIP, THIGH, AND LEG (CONT.)

- Soleus
  - Deep to the gastrocnemius.
  - Originates on the tibia.
  - A strong plantar flexor of the foot.

LEG MUSCLES REVIEW

WHAT MUSCLE INSERTS THROUGH THE ACHILLES TENDON TO CAUSE PLANTAR FLEXION OF THE FOOT?

Gastrocnemius

WHICH MUSCLE ACTS TO DORSIFLEX AND INVERT THE FOOT?

Anterior Tibialis

WHAT GROUP OF MUSCLES ACT TO POWERFULLY EXTEND THE KNEE?

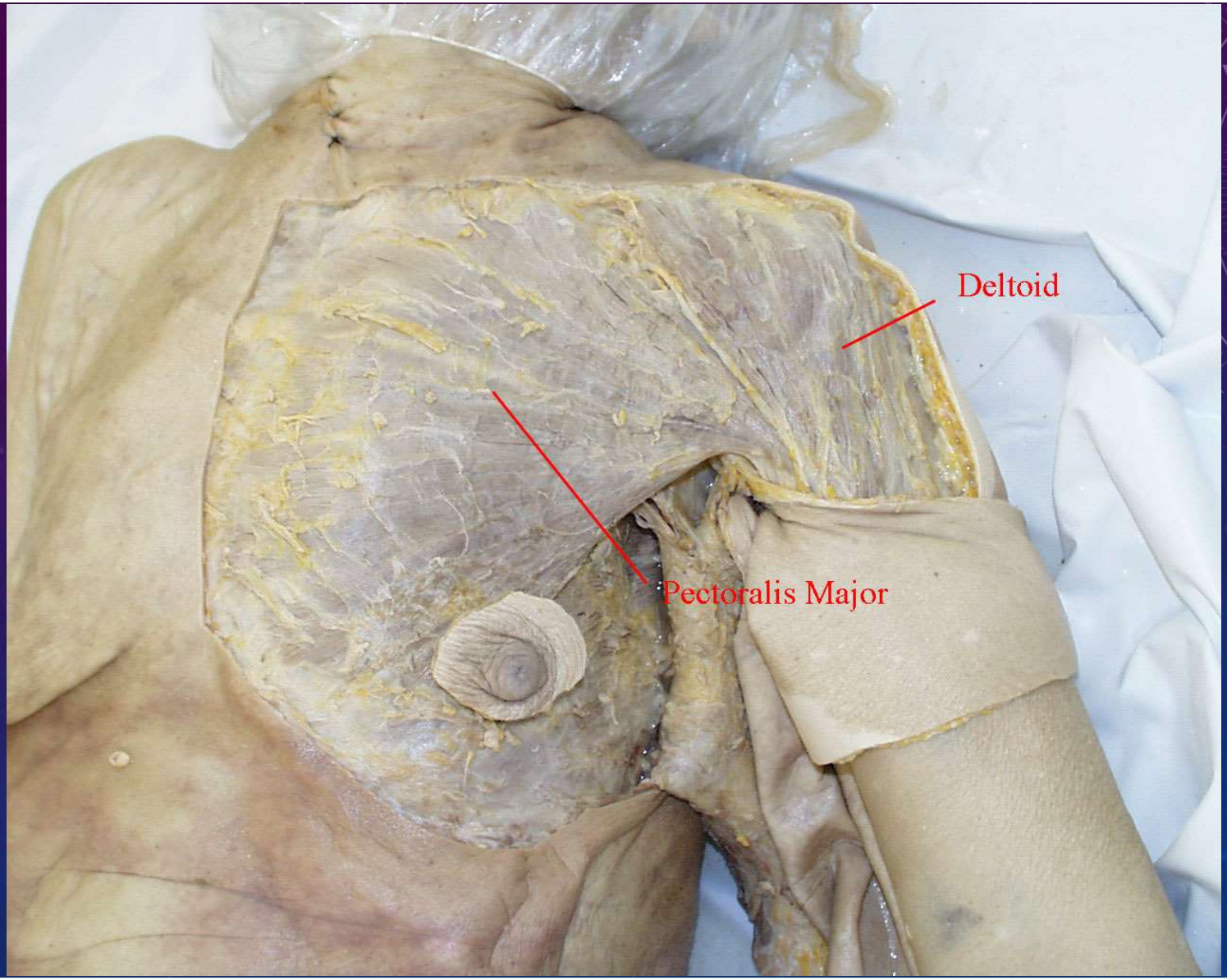
Quadriceps group

WHICH MUSCLE IS A POWERFUL HIP EXTENSOR THAT WORKS TO BRING THE THIGH IN A STRAIGHT LINE WITH THE PELVIS?

Gluteus Maximus

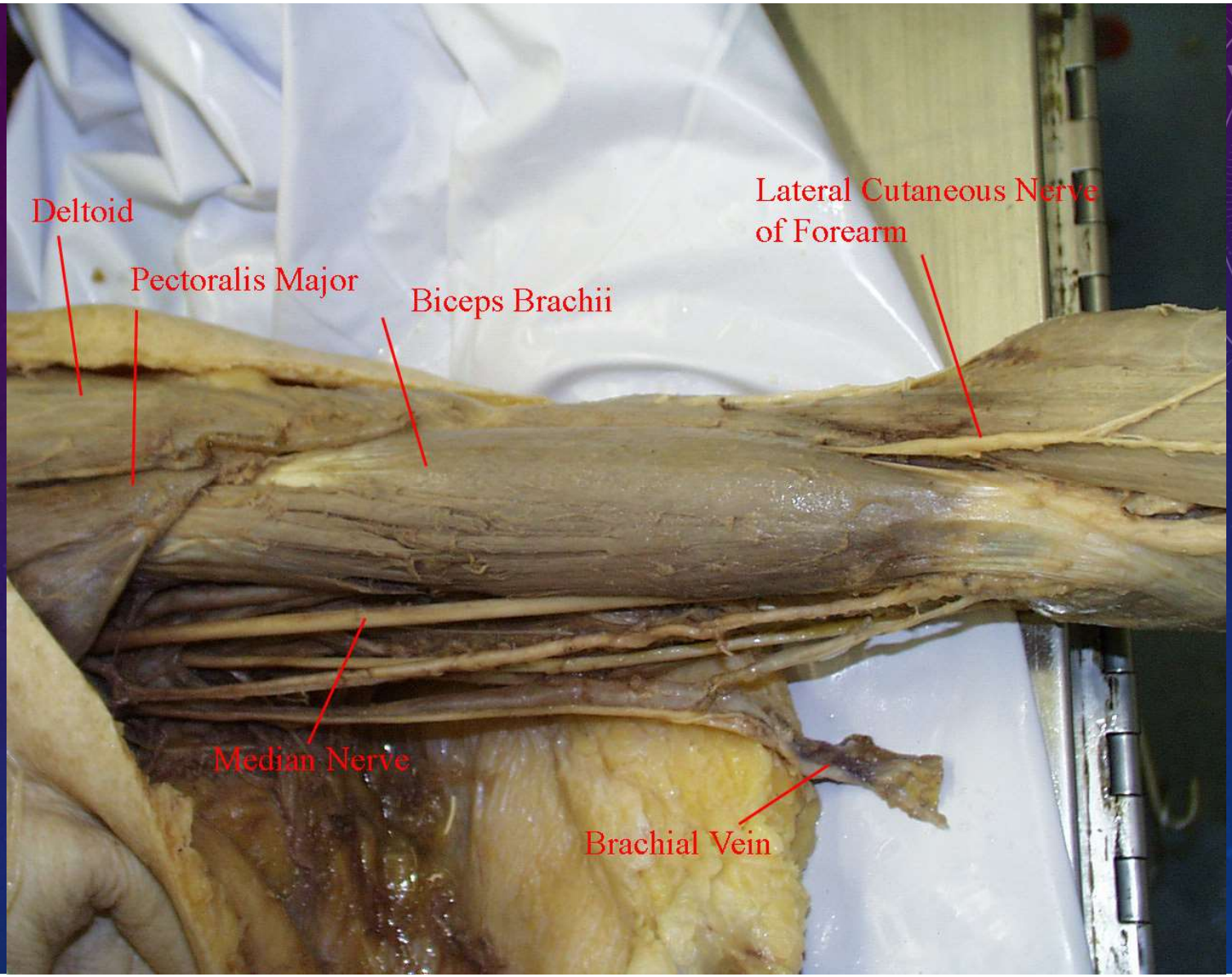
WHICH MUSCLE OF THE LOWER LIMB IS A PRIME MOVER OF HIP FLEXION AND ALSO ACTS AS A POSTURAL MUSCLE TO KEEP THE UPPER BODY FROM FALLING BACKWARD WHEN STANDING ERECT?

Iliopsoas


Deltoid
Pectoralis Major

MUSCLES OF THE ARM AND FOREARM

- Biceps Brachii
  - Originates by two heads from the shoulder girdle and inserts into the radial tuberosity.
  - Prime mover for flexion of the forearm
  - Also act to supinate the forearm.

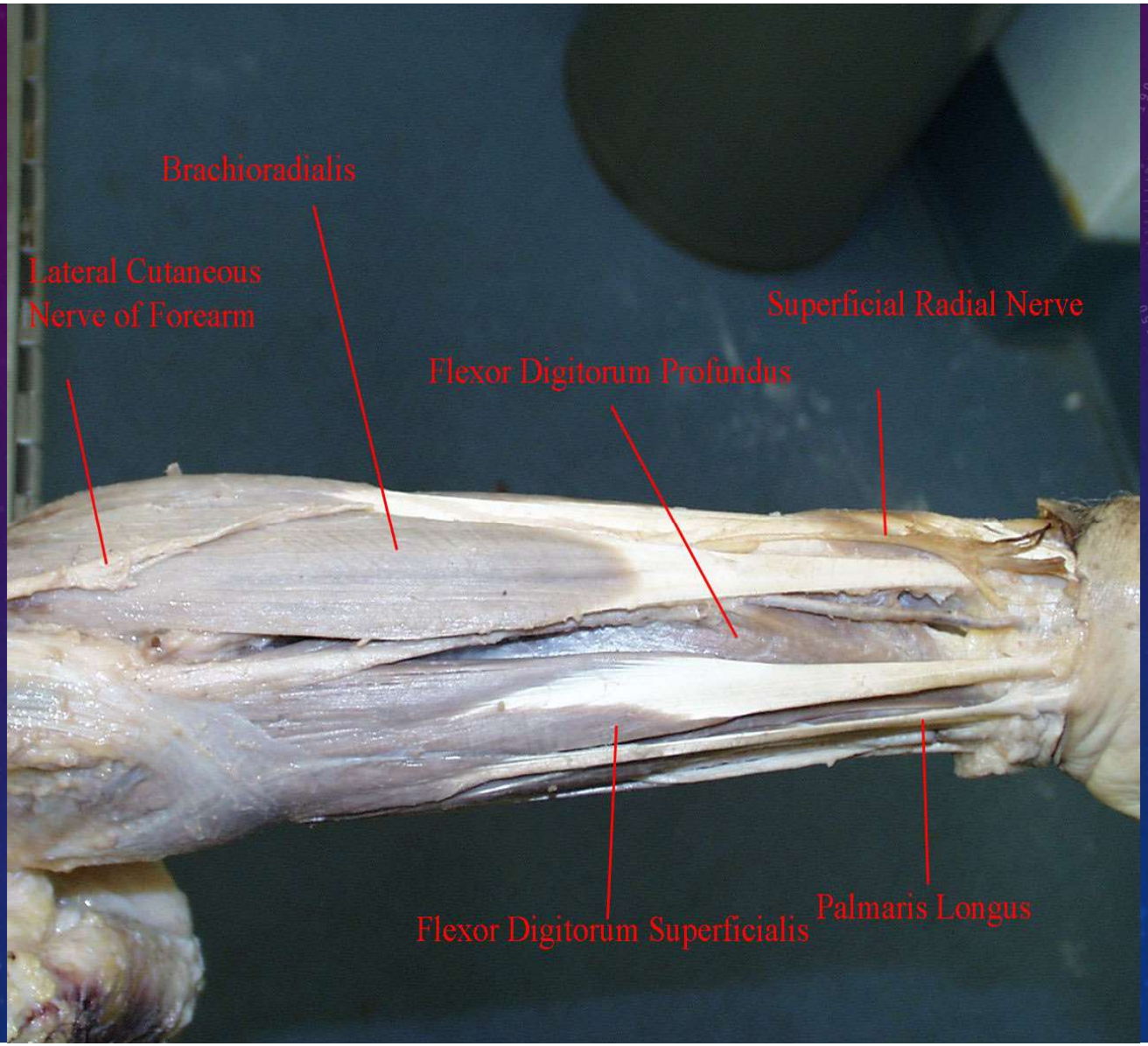

Deltoid
Pectoralis Major
Biceps Brachii
Lateral Cutaneous Nerve of Forearm
Median Nerve
Brachial Vein

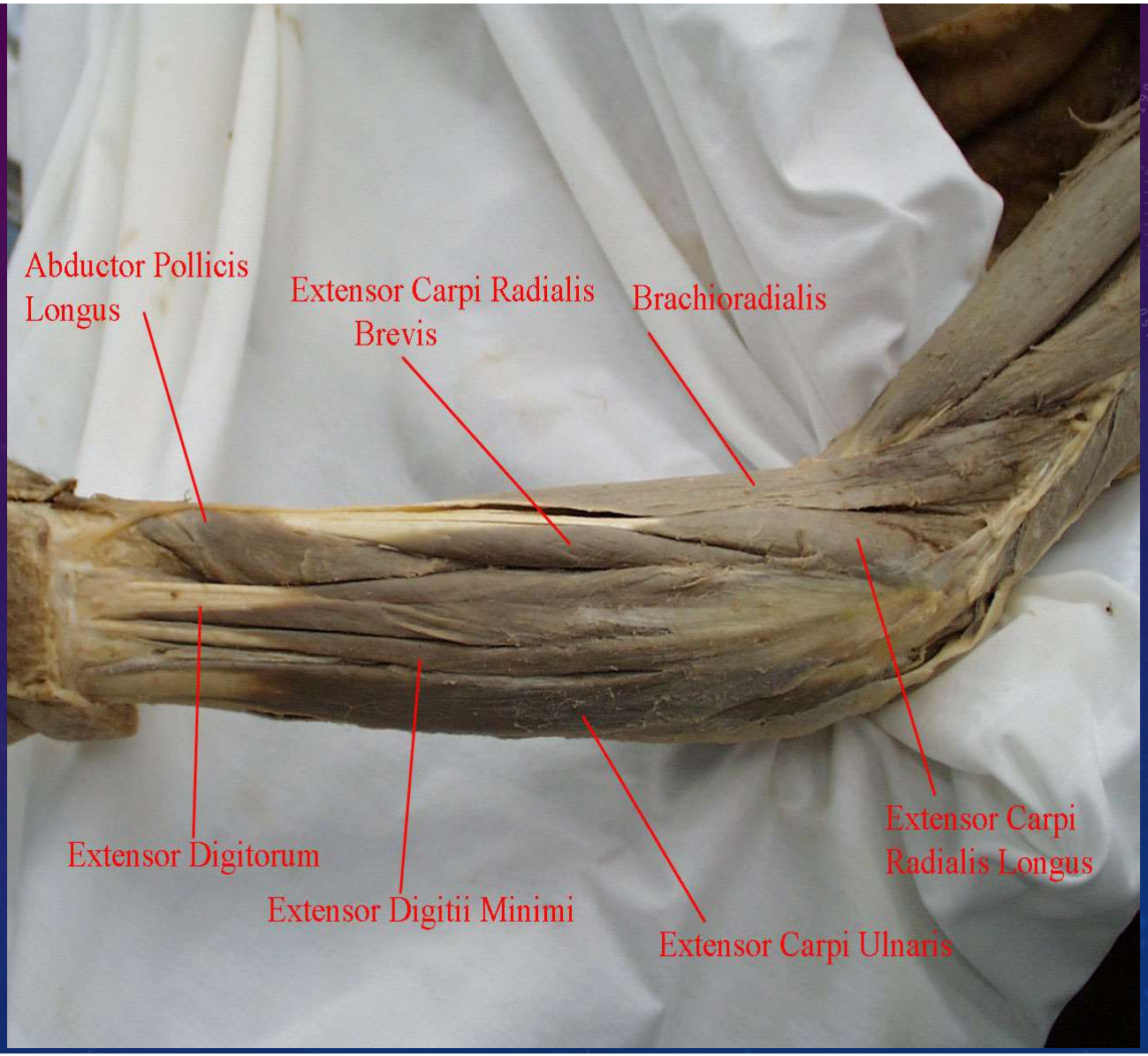
MUSCLES OF THE ARM AND FOREARM (CONT.)

- Brachialis
  - Lies deep to the biceps muscle
  - Also acts to cause elbow flexion.

MUSCLES OF THE ARM AND FOREARM (CONT.)

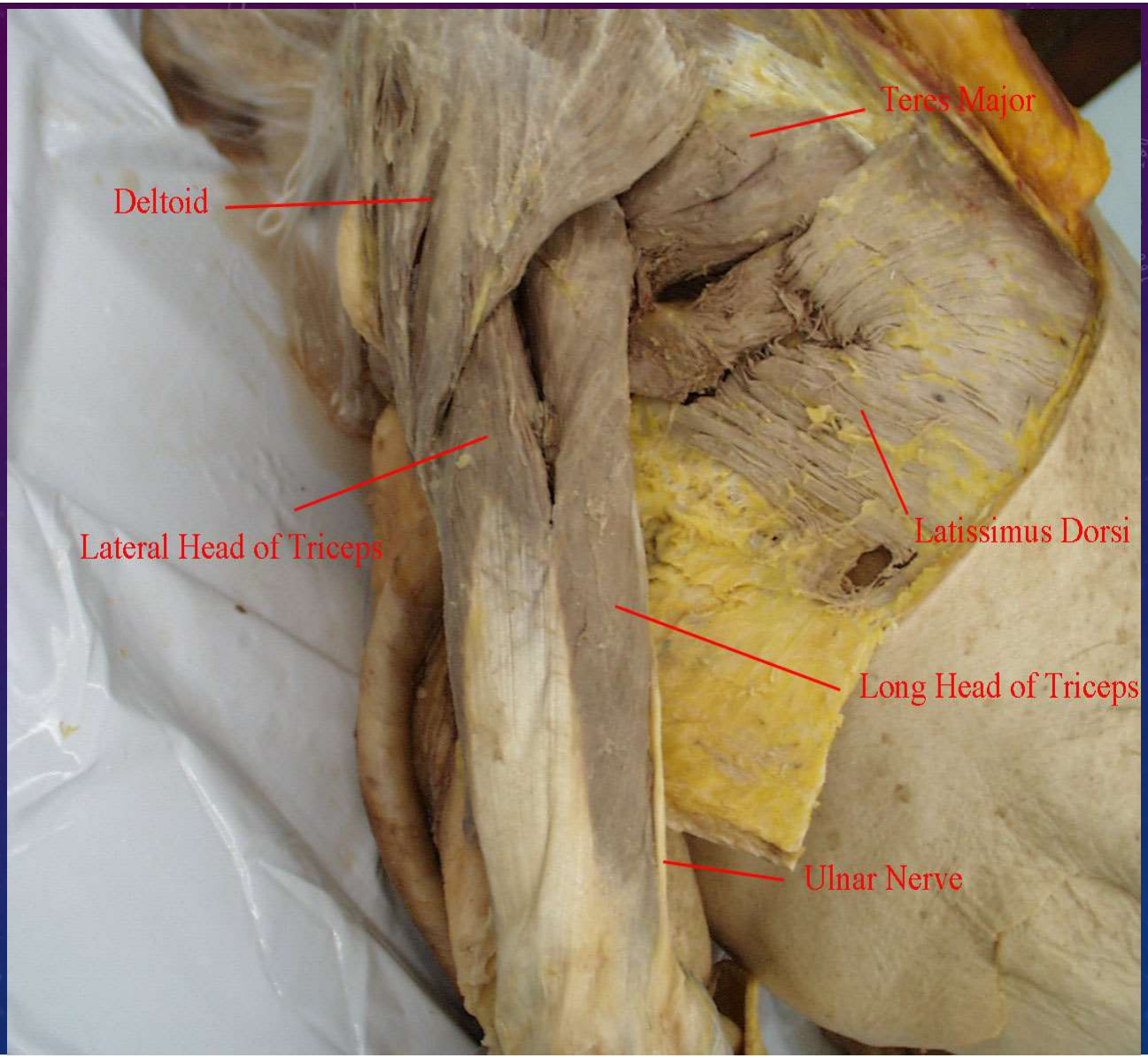
- Brachioradialis
  - Originates on the humerus and inserts into the distal forearm.
  - Assists in flexion at the elbow and also supinates/pronates the forearm.


Brachioradialis
Lateral Cutaneous Nerve of Forearm
Superficial Radial Nerve
Flexor Digitorum Profundus
Flexor Digitorum Superficialis
Palmaris Longus


Abductor Pollicis Longus
Extensor Carpi Radialis Brevis
Brachioradialis
Extensor Digitorum
Extensor Digitii Minimi
Extensor Carpi Ulnaris
Extensor Carpi Radialis Longus

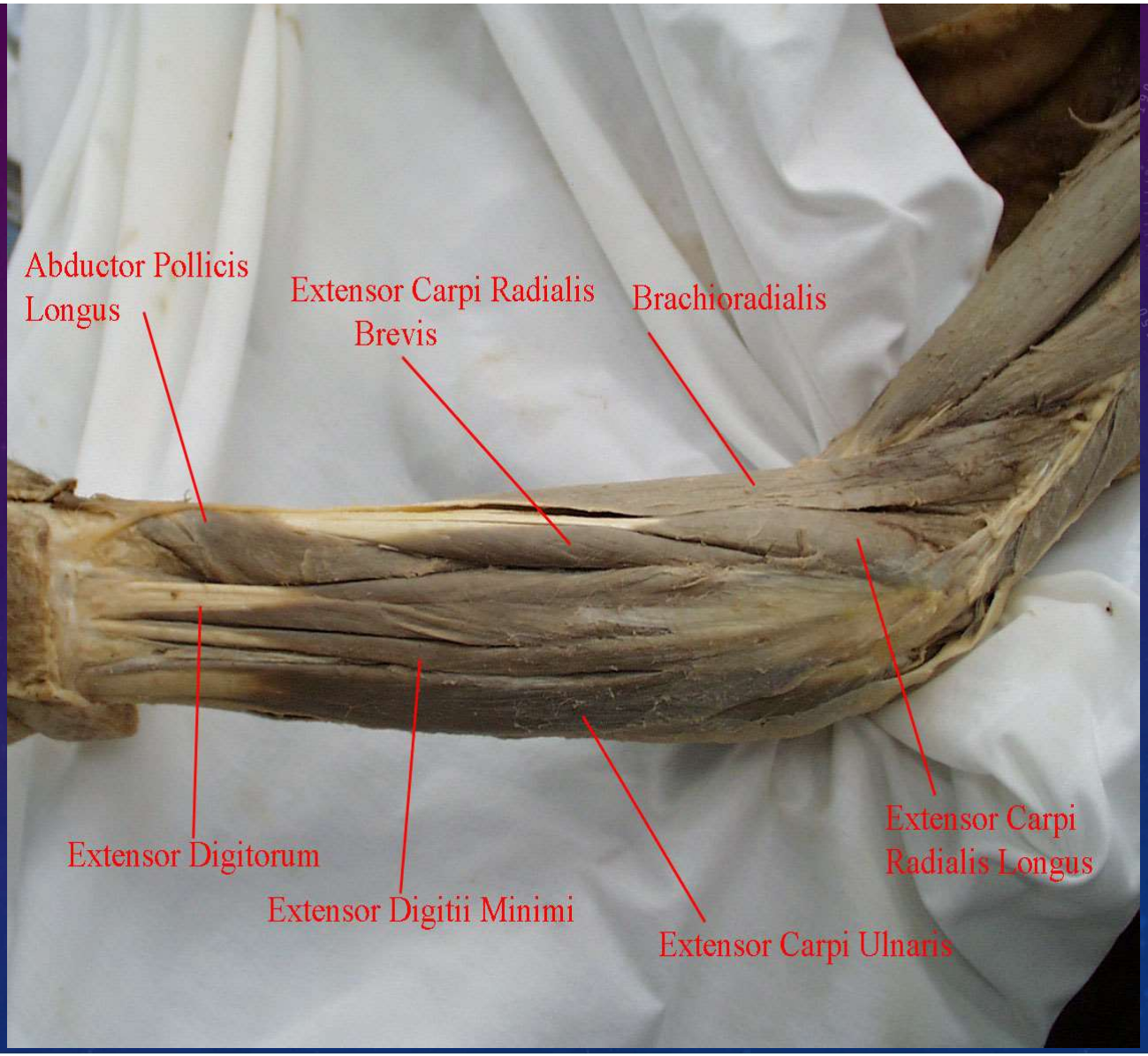
MUSCLES OF THE ARM AND FOREARM (CONT.)

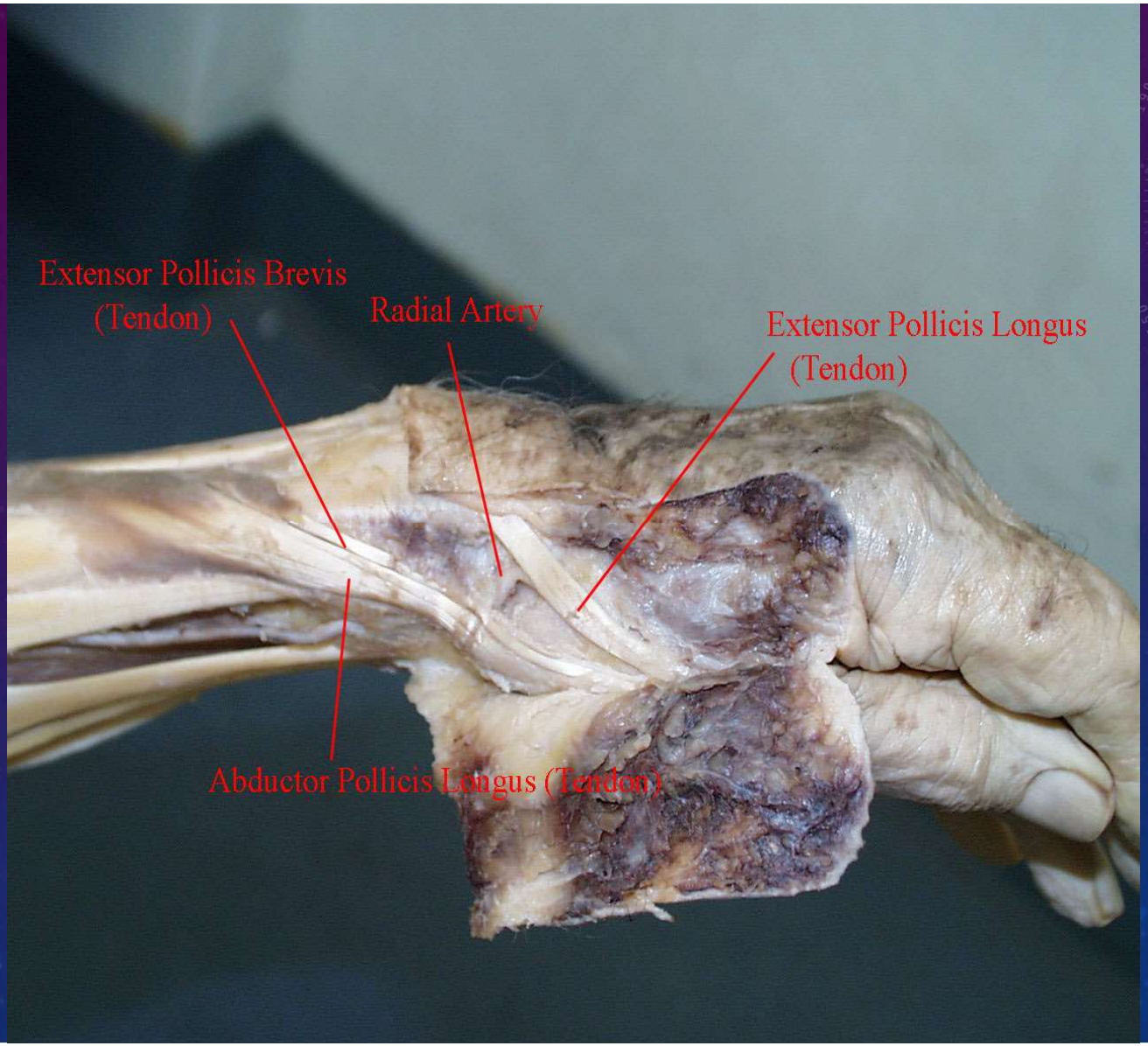
- Triceps Brachii
  - Originates from the shoulder girdle and proximal humerus.
  - Inserts into the olecranon process of the ulna.
  - Prime mover of elbow extension (also antagonist of Biceps Brachii).
  - Often called the “boxer’s” muscle.

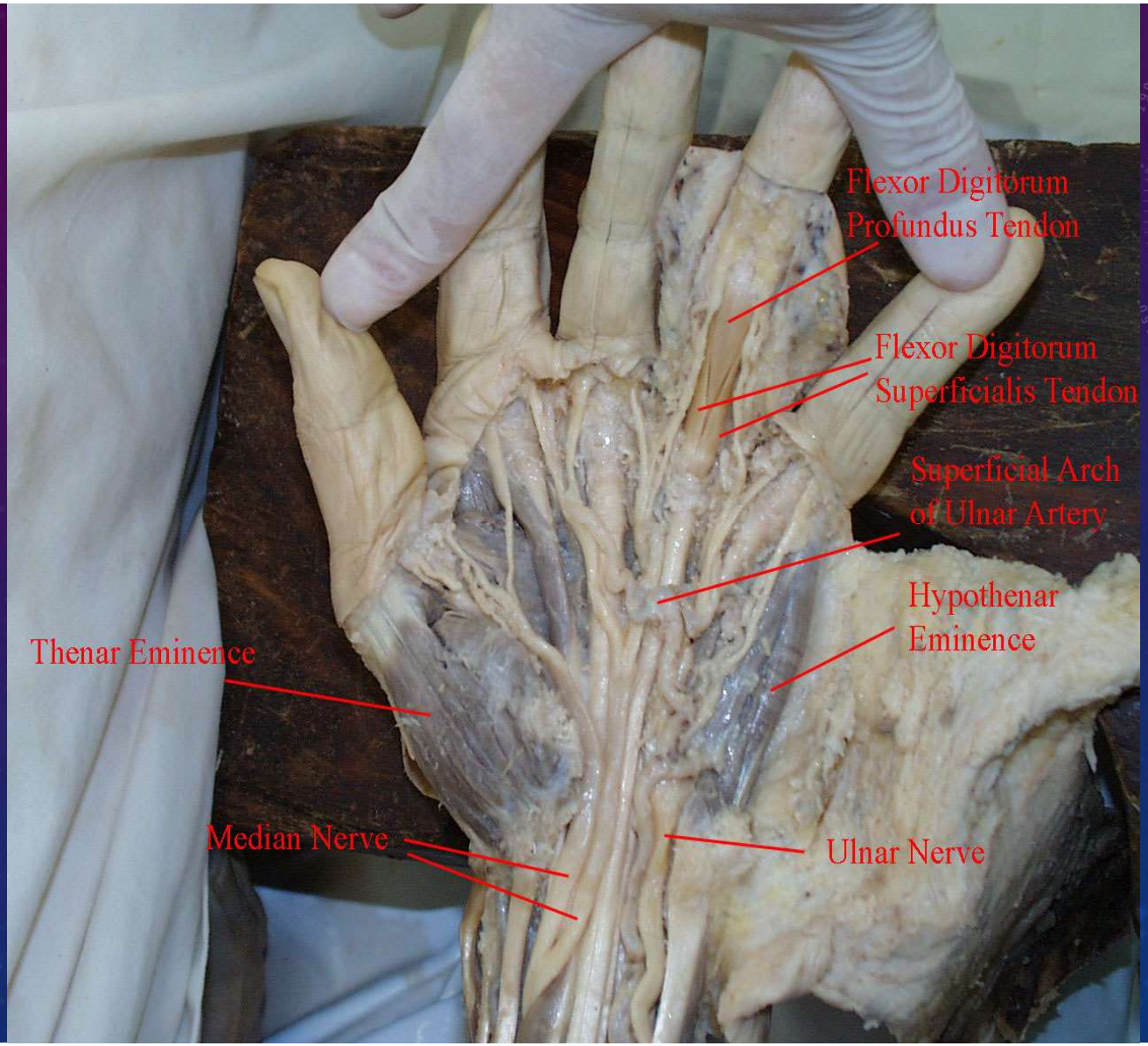

Teres Major
Deltoid
Lateral Head of Triceps
Latissimus Dorsi
Long Head of Triceps
Ulnar Nerve

MUSCLES OF THE ARM AND FOREARM (CONT.)

- Forearm muscles
  - Extensor digitorum
  - Extensor carpi radialis
  - Flexor carpi ulnaris
  - Flexor digitorum superficialis


Abductor Pollicis Longus
Extensor Carpi Radialis Brevis
Brachioradialis
Extensor Digitorum
Extensor Digitii Minimi
Extensor Carpi Ulnaris
Extensor Carpi Radialis Longus


Extensor Pollicis Brevis
(Tendon)
Radial Artery
Extensor Pollicis Longus
(Tendon)
Abductor Pollicis Longus (Tendon)


Flexor Digitorum Profundus Tendon
Flexor Digitorum Superficialis Tendon
Superficial Arch of Ulnar Artery
Hypothenar Eminence
Thenar Eminence
Median Nerve
Ulnar Nerve

ENDS MATERIAL FOR QUIZ 6.5

ARM AND FOREARM MUSCLES REVIEW

A MUSCLE THAT EXTENDS THE ELBOW

Triceps Brachii

SHOULDER ABDUCTOR, USED TO RAISE THE ARM OVERHEAD

Deltoid

WRIST FLEXOR THAT FOLLOWS THE ULNA

Flexor carpi ulnaris

MUSCLE THAT EXTENDS THE FINGERS

Extensor digitorum

PRIME MOVER OF ELBOW FLEXION

Biceps brachii

MUSCLE THAT FLEXES THE FINGERS

Flexor digitorum superficialis

WHAT IS THE ANTAGONIST OF THE BICEPS BRACHII?

The triceps brachii

DIGIT FLEXOR MUSCLES ARE LOCATED ON THE _____ ASPECT OF THE FOREARM.

Anterior

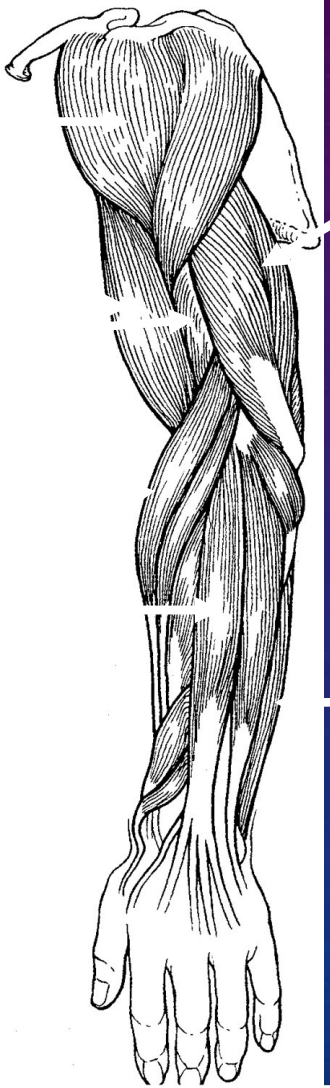
Deltoid

Biceps Brachii

Brachialis

Brachioradialis

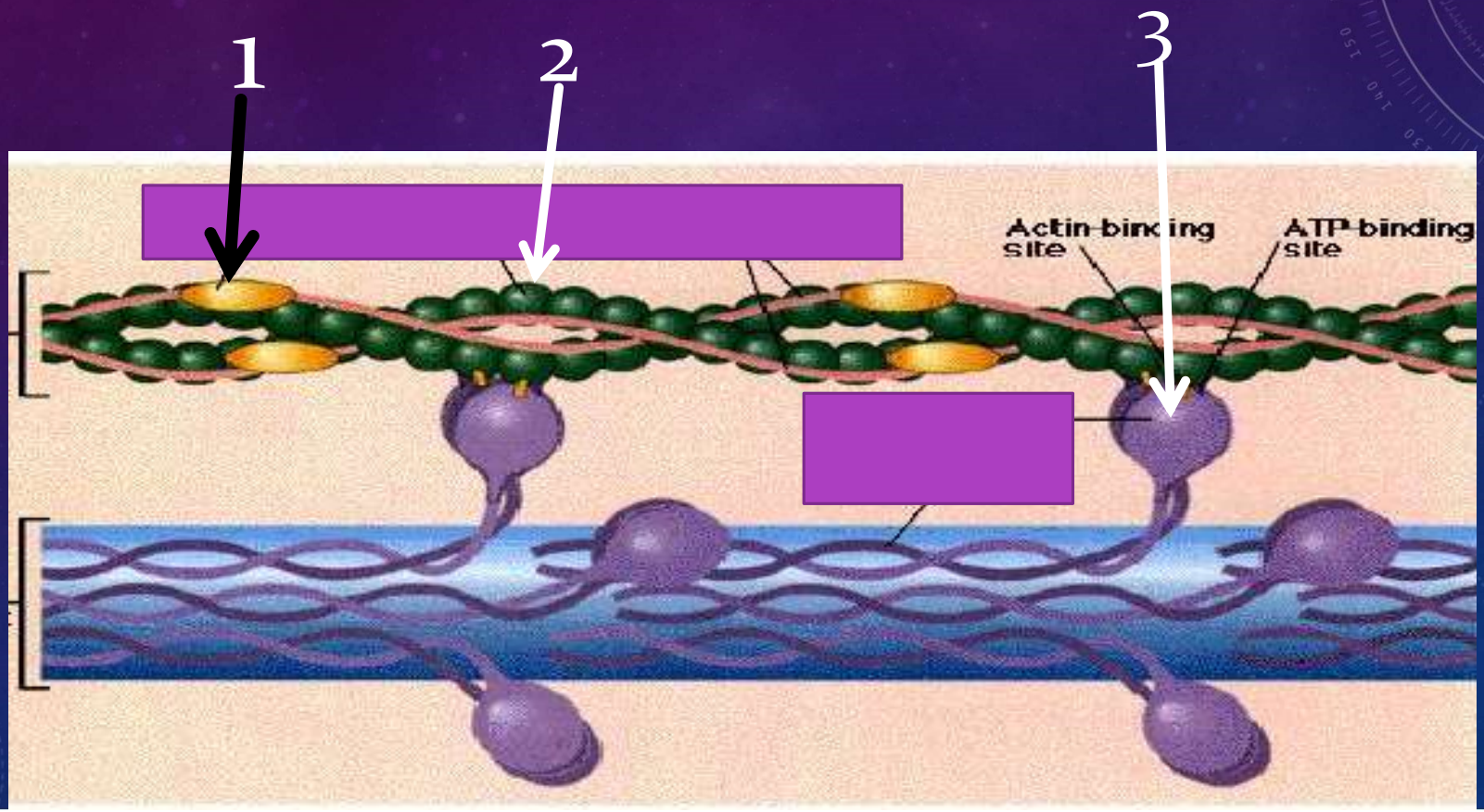
Extensor Digitorum



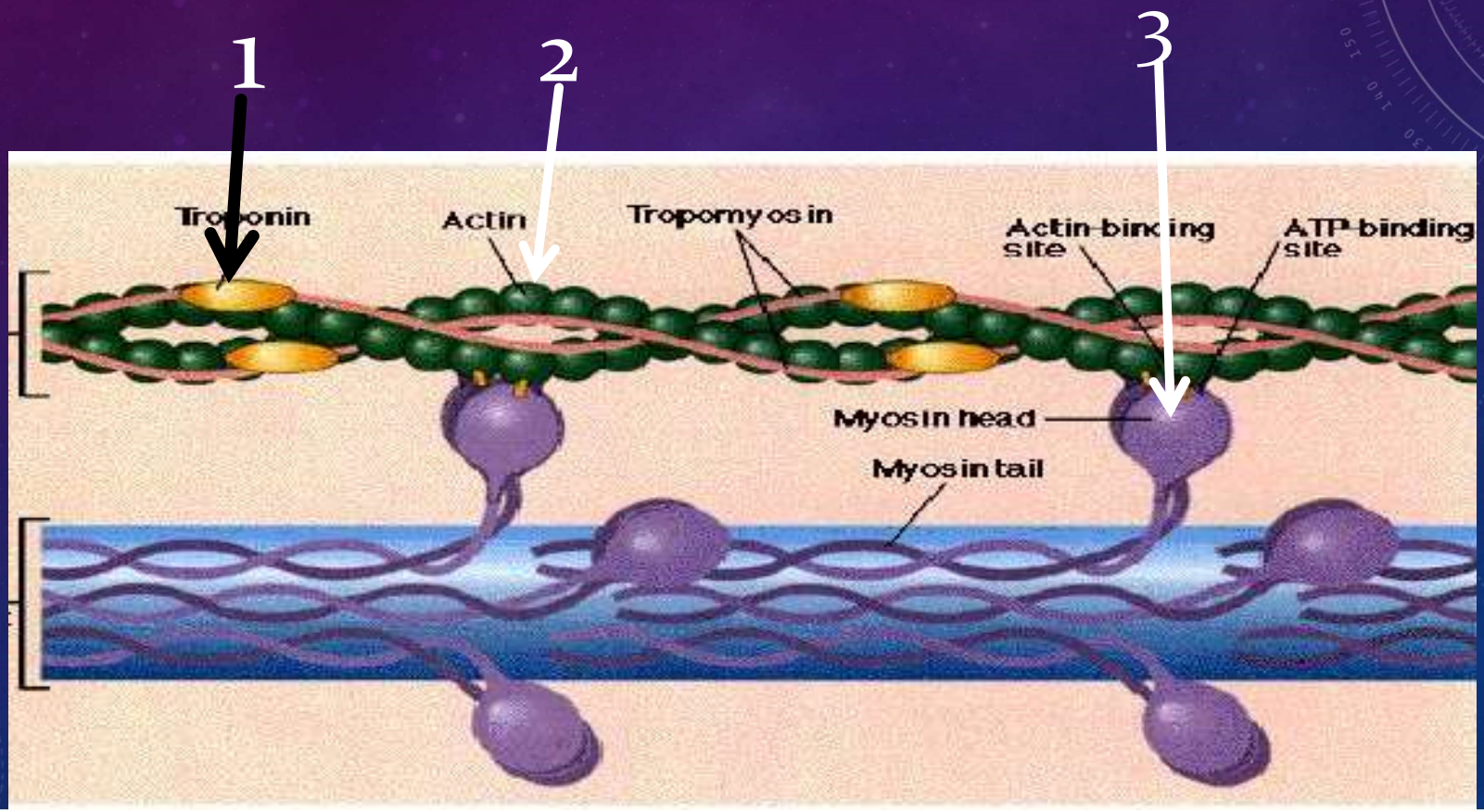
Triceps Brachii

Flexor carpi ulnaris

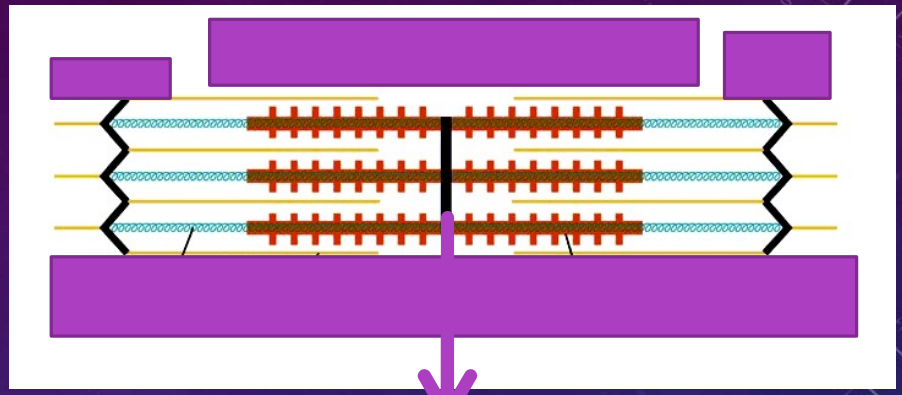
Name 1,2,3



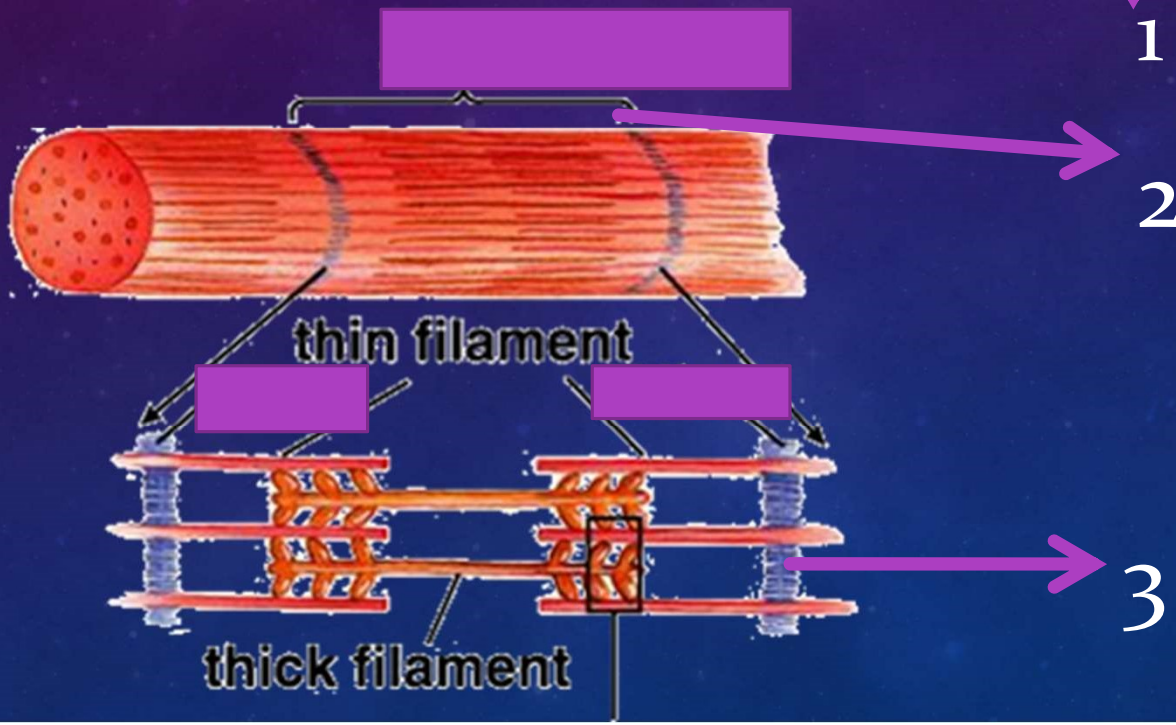
Name 1,2,3


1
2
3
Troponin
Actin
Tropomyosin
Actin-binding site
ATP-binding site
Myosin head
Myosin tail

Name 1,2,3



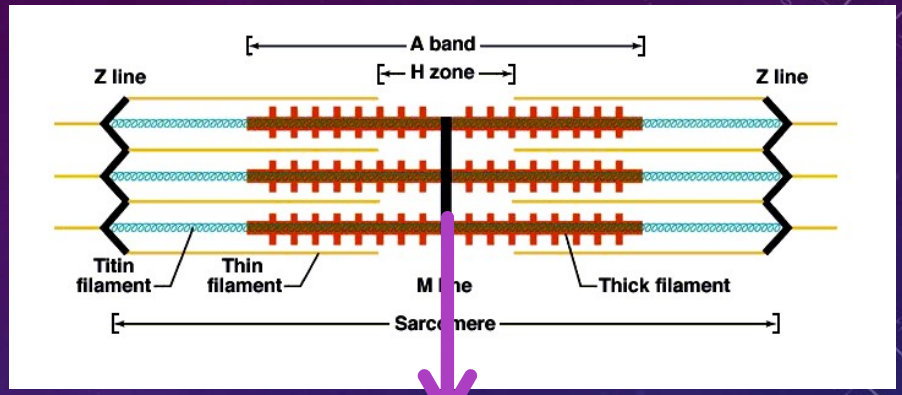
1



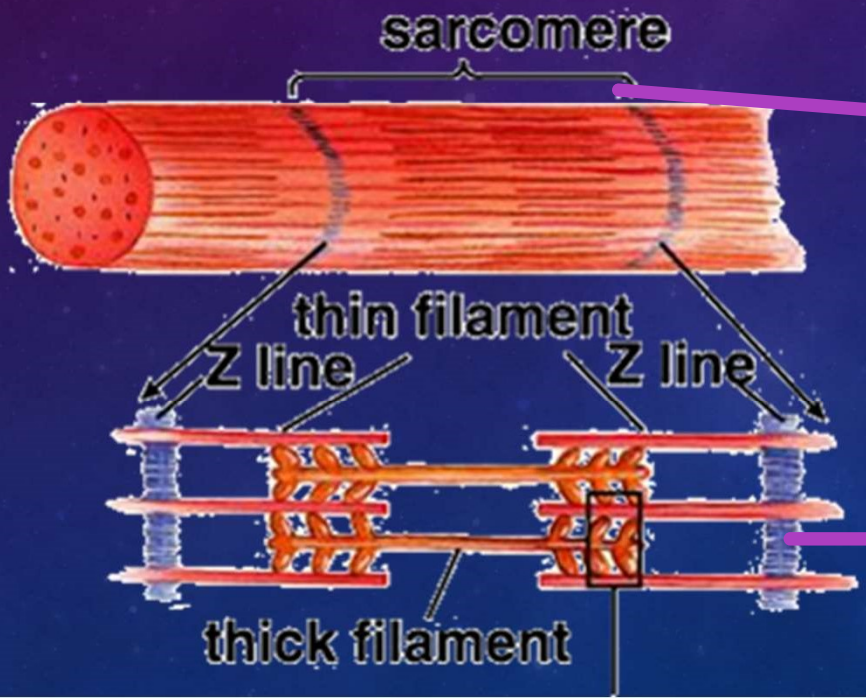
2

3

Name 1,2,3


A band
H zone
Z line
Z line
Titin filament
Thin filament
Thick filament
Sarcomere

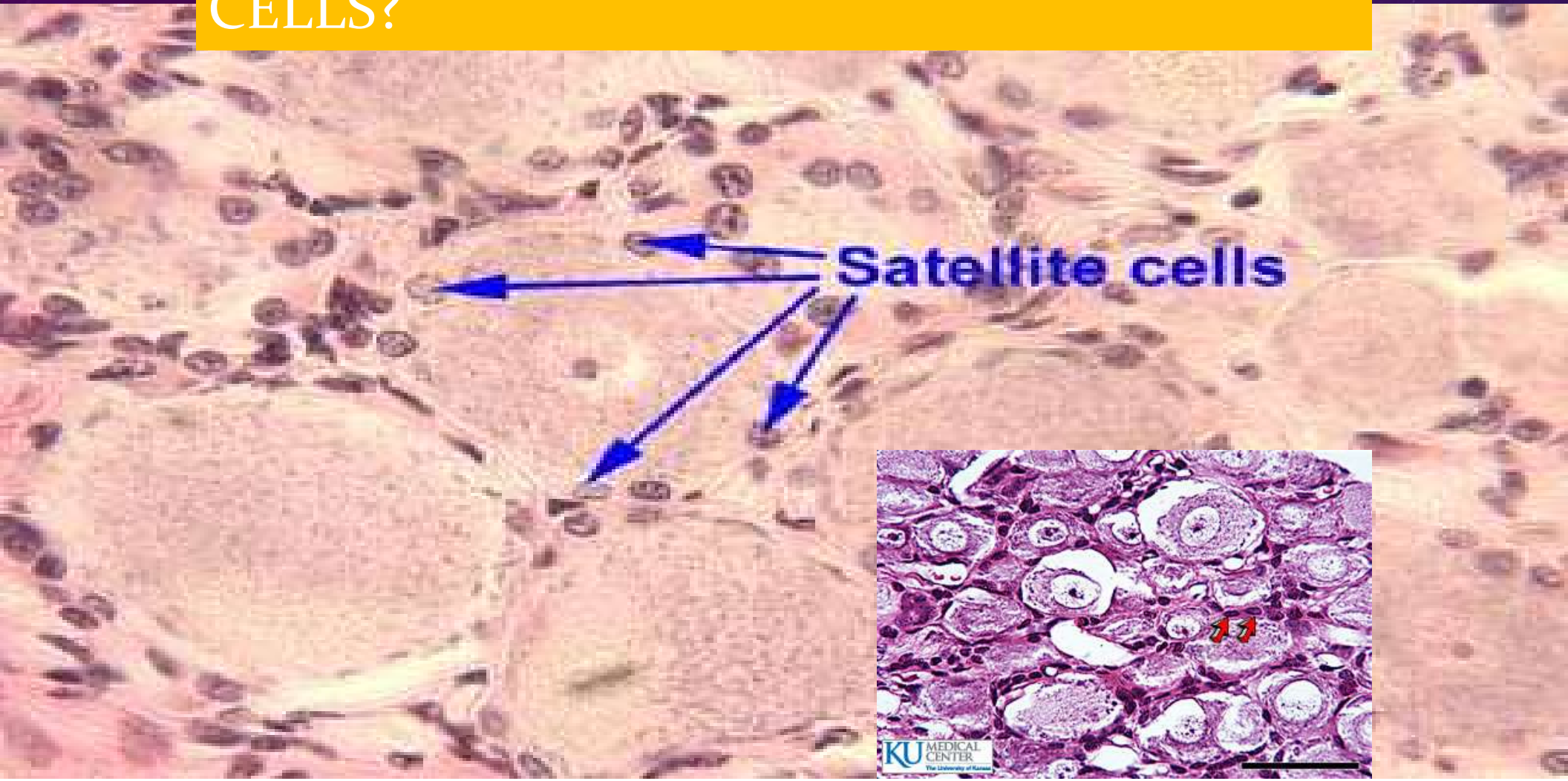
1

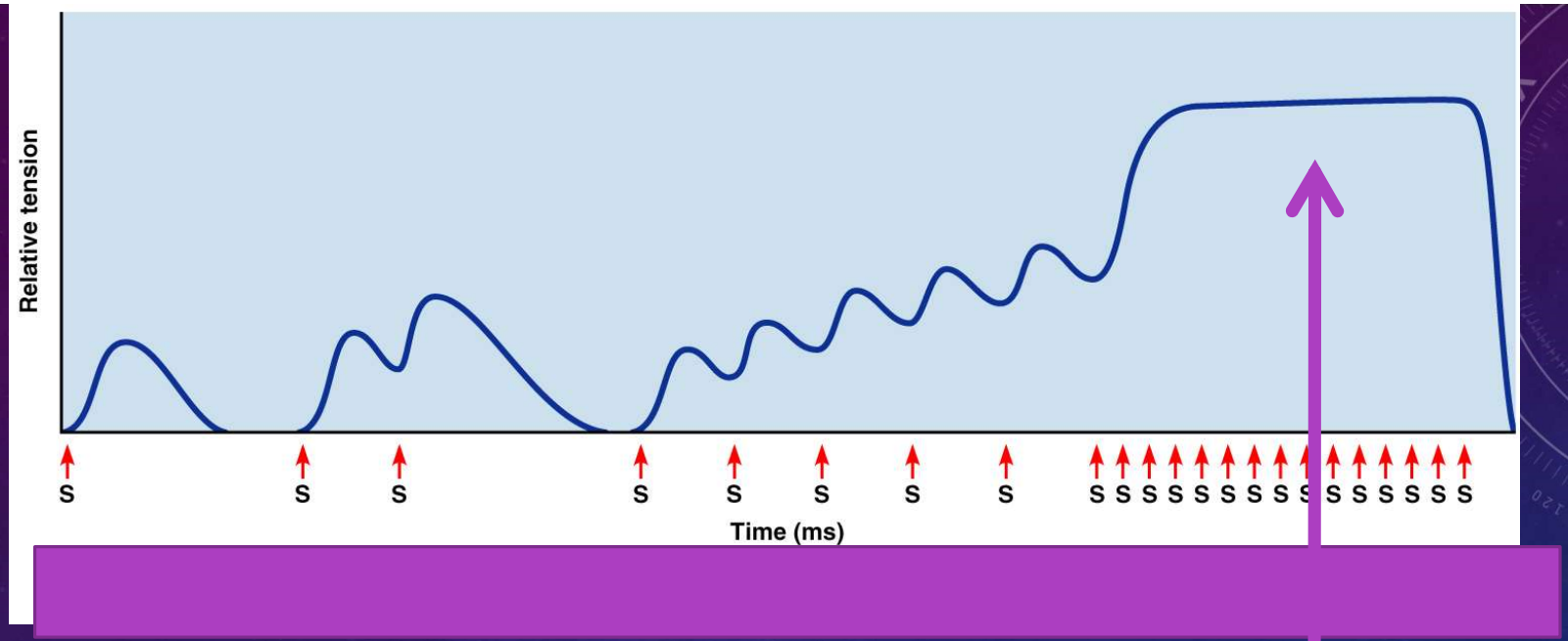

sarcomere
thin filament
Z line
Z line
thick filament

2

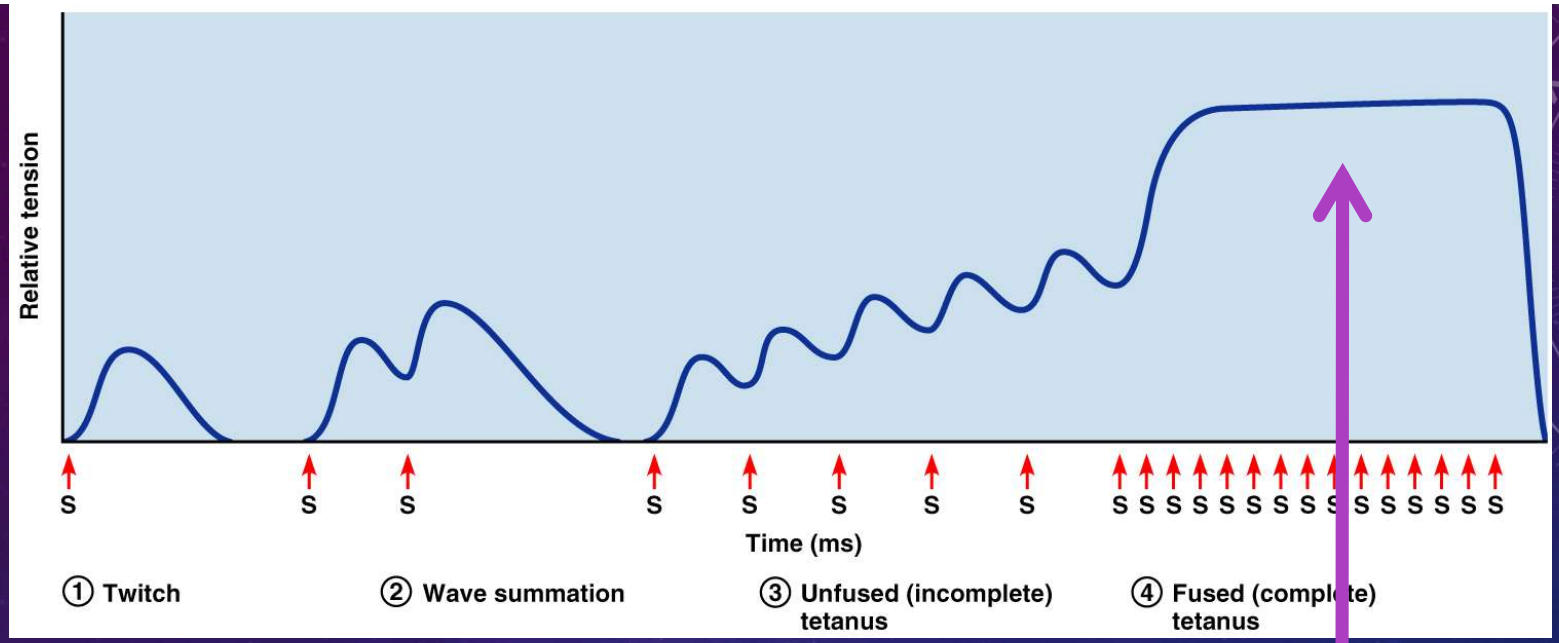
3

18/ WHAT IS THE FUNCTION OF THESE CELLS?





19/ WHAT IS GOING ON IN THIS PART OF THE GRAPH?



19/ WHAT IS GOING ON IN THIS PART OF THE GRAPH?

The characteristic of muscle that allows it to be passively stretched is
A. conductivity.
B. elasticity.
C. excitability.
D. extensibility.
E. contractility.

Which are possible functions of skeletal muscles?
a: Maintenance of posture
b: Both highly coordinated and localized simple movements
c: Temperature regulation
d: Support of certain body organs
e: Regulation of the movement of material through certain body tracts
A. a, b, e
B. a, b, c
C. a, b, c, e
D. a, b, c, d
E. a, b, c, d, e

The property of muscle tissue that allows an impulse to travel down the entire length of the cell membrane is

A. elasticity.
B. conductivity.
C. extensibility.
D. contractility.
E. responsibility.
.

The spring-like property that returns muscle to its original length after a contraction ends is

A. extensibility.
B. elasticity.
C. contractility.
D. treppe effect.
E. conductivity.

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E. conductivity.

Which is a correct listing of the hierarchy of a skeletal muscle's components, beginning with the smallest?

a: Myofibrils
b: Muscle fiber
c: Fascicle
d: Skeletal muscle

A. a, b, c, d
B. a, c, b, d
C. d, c, b, a
D. c, b, a, d
E. b, c, a, d

The neurons that stimulate muscle contraction are called _____ neurons.

A. sensory
B. contractile
C. inhibitory
D. motor
E. association

Which is the correct order of the connective tissue layers of a skeletal muscle, beginning with the most superficial?

a: Endomysium
b: Epimysium
c: Perimysium

A. a, b, c
B. b, a, c
C. c, a, b
D. b, c, a
E. c, b, a

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B. b, a, c
C. c, a, b
D. b, c, a
E. c, b, a

Which tissue type covers body surfaces and lines the inside of organs and body cavities?
A. Muscle
B. Connective
C. Epithelial
D. Nervous
E. None of the choices is correct.

In what tissue would you expect to find very little, if any, extracellular matrix?
A. Muscle tissue
B. Nervous tissue
C. Immune tissue
D. Epithelial tissue
E. Connective tissue

Which feature is *not* characteristic of epithelial tissue?
A. Polarity
B. Cells connected to each other by intercellular junctions
C. High regeneration capacity
D. Attachment to a basement membrane
E. Large amount of extracellular matrix

Which of the following is *not* a function of epithelial tissue?
A. Secretion
B. Physical protection
C. Selective permeability
D. Sensation
E. No exceptions; these are all functions of epithelial tissue

Which is avascular (lacks blood vessels)?
A. Epithelial tissue
B. Muscle tissue
C. Nervous tissue
D. Connective tissue
E. All of the choices are correct.

What specialized feature of an epithelium consists of a reticular lamina, a lamina densa, and a lamina lucida?
A. Microfilament
B. Desmosome
C. Fenestrated membrane
D. Basement membrane
E. Plasma membrane

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D. Basement membrane
E. Plasma membrane

a. reticular
b. b. elastic conn. tissue
c. c. areolar
d. d. hyaline cartilage
e. e. dense fibrous irregular
f. f. dense fibrous regular
g. g. bone
h. h. elastic cartilage
i. i. adipose

21. parallel bundles of dense collagen fibers
22. dermis of skin
23. embryonic appendicular skeleton
24. fat storage
25. yellow marrow
26. ground substance hard due to calcium salts
27. packing around blood vessels

Which is *not* correct regarding articulations?

A. An articulation is a joint between a bone and another bone, cartilage, or tooth.
B. All articulations contain some type of cartilage.
C. Arthrology is the scientific study of articulations.
D. Articulations can range in motion from freely mobile to immobile.
E. There are three structural categories of articulations.

The term "diarthrosis" refers to a joint that is

A. immobile.
B. freely mobile.
C. fused.
D. slightly mobile.
E. dislocated.

a. reticular
b. b. elastic conn. tissue
c. c. areolar
d. d. hyaline cartilage
e. e. dense fibrous irregular
f. f. dense fibrous regular
g. g. bone
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23. embryonic appendicular skeleton
24. fat storage
25. yellow marrow
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Answers: 21-f, 22-e, 23-d, 24-i, 25-i, 26-g, 27-c

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One correct answer per question. Choices may be used more than once.

a. stratified squamous
b. b. pseudostratified
c. c. transitional
d. d. simple cuboidal
e. e. simple columnar
f. f. simple squamous

28. simple, but looks like two layers
29. forms epidermis
30. lines urinary bladder
31. peculiar surface cells change shape, slide orver one another
32. forms thin serous membranes
33. single layer of flattened cells

The body system that provides support and protection as well as being a site of blood cell production (hemopoiesis) is the _____ system.

A. skeletal
B. muscular
C. cardiovascular
D. respiratory
E. lymphatic

The system responsible for the exchange of gases between the blood and atmospheric air is the _____ system.

A. urinary
B. respiratory
C. cardiovascular
D. endocrine
E. nervous

Which describes the anatomic position?

A. Body is upright.
B. Palms are facing forward.
C. Thumbs point away from the body.
D. Feet are flat on the floor.
E. All of these apply.

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E. All of these apply.

What is the anatomic term for the hip region?

A. Sternal
B. Coxal
C. Dorsal
D. Crural
E. Sural

Which serous membrane covers the surface of an organ?

A. The parietal layer
B. The visceral layer
C. The muscle layer
D. The dorsal layer
E. The ventral layer

The pleural cavity is the

A. same as the mediastinum.
B. the serous membrane lining the abdomen.
C. space within which the heart sits.
D. potential space between the two serous membranes surrounding a lung.

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What are the 26 facts about skeletal muscles?

Skeletal Muscle Fibers?

1. A skeletal muscle fiber is a single muscle cell.
2. The sarcolemma is the plasma membrane of a muscle cell.
3. The sarcoplasm is the cytoplasm of a muscle cell.
4. The sarcoplasm contains many small nuclei, mitochondria and myofibrils.
5. Myofibrils are threadlike structures and are located in the sarcoplasm.
6. Myofibrils play a fundamental role in the muscle contraction mechanism.
7. Thick myofilaments are composed of myosin.
8. Thin myofilaments are composed of actin.
9. The organization of myofilaments produces the alternating light and dark striation characteristic of skeletal muscles.
10. A sarcomere is a repeating pattern of a myofibril.
11. Myofibrils may be thought of as sarcomeres joined end to end.
12. I bands are composed of thin actin filaments.
13. Z lines are structures that connect that anchor I bands.
14. A bands are composed of thick myosin filaments overlapping thin actin filaments.

15. The H zone is a central region of an A band that only contains thick filaments.
16. The M line is a region of an A band which consists of proteins that help hold the thick filaments in place.
17. Titin connects proteins that connect myosin filaments to Z lines.
18. A sarcomere extends from one Z line to another Z line.
19. Each myosin molecule consists of two twisted protein strands with globular parts called cross-bridges that project outward along their lengths.
20. Thin filaments consist of double strands of actin twisted into a helix.
21. Actin has a binding site to which the cross-bridges of a myosin molecule can attach.
22. Troponin and tropomyosin associate with actin filaments.
23. Sarcoplasmic reticulum is endoplasmic reticulum of a muscle fiber.
24. Transverse tubules are membranous channels that extend into the sarcoplasm as invaginations continuous with the sarcolemma and contains extracellular fluid.
25. Cisternae are enlarged portions of sarcoplasmic reticulum.
26. A triad is formed by one transverse tubule and two cisternae.