

Human Anatomy — Biology 255

Exam #3

Please place your name and I.D. number on the back of the last page of this exam.

You must answer *all* questions on this exam. Because statistics demonstrate that, on average, between 2-5 questions on every 100-point exam are ambiguous enough to come out "aberrant" on an item analysis, the total number of points possible on this exam is 106. However, grades will be calculated out of a possible 100 points, assuming that 2—3 questions on this exam are aberrant.

Think Questions — Ability to visualize information discussed in class

Section 1: Muscle identification in a cross sectional view of the arm. On the next page is a cross section of a middle portion of the arm. If a muscle on the following page is labeled place the proper letter in the appropriate space. However, *if a muscle is not labeled place XX in the space provided.* (NOTE LABELING OF ANTERIOR AND MEDIAL) (2 points each)

- _____ 1. Brachialis
- _____ 2. Lateral head of the triceps brachii
- _____ 3. Long head of the triceps brachii

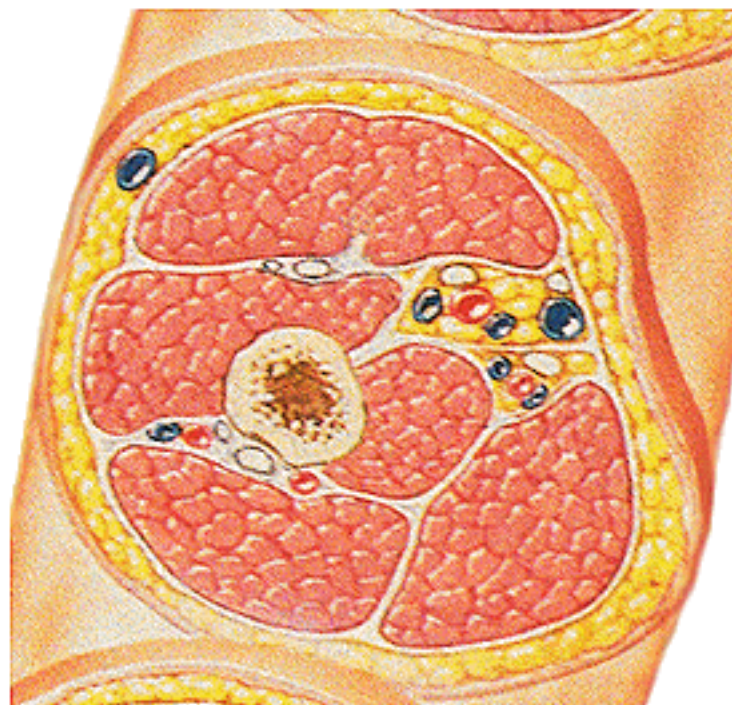
Section 2: Muscle identification in a cross section of the forearm. On the next page is a cross section of a middle portion of the forearm. If a muscle on the following page is labeled place the proper letter in the appropriate space. However, *if a muscle is not labeled place XX in the space provided.* (NOTE LABELING OF ANTERIOR AND LATERAL) (2 points each)

- _____ 4. Brachioradialis
- _____ 5. Palmaris longus
- _____ 6. Flexor digitorum superficialis
- _____ 7. Flexor carpi ulnaris

Plate Number
410B

Arm

Middle Cross Section

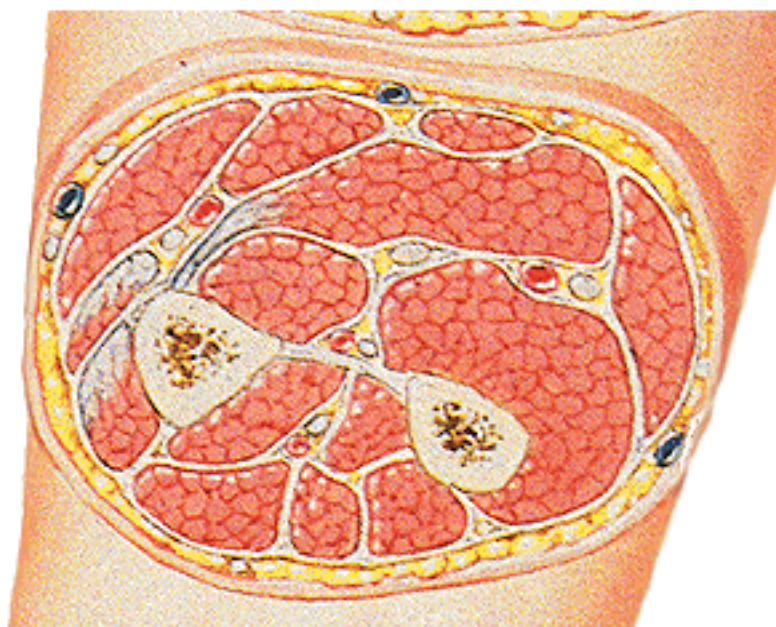


F. Natter
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Plate Number
423B

Forearm

Middle Cross Section



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Sections 3 to 6: Recall of information discussed in class.

Section 3: Muscles of the shoulder and arm. If the following statements are true place a (+) in the space provided. If the statements are false place a (O) in the space provided. (2 points each)

- _____ 8. An extrinsic muscle is defined by the following: They have their origins on the pelvic girdle, have their insertion either onto the pelvic girdle or the arm, are not confined to the upper limb, and include the superficial muscles of back, the muscles of the pelvic girdle, and the serratus anterior muscle.
- _____ 9. The intrinsic muscles of the upper limb are confined to the upper limb, arise from bones of the pectoral girdle and insert onto the humerus and therefore act only on the shoulder joint. These muscles include the deltoid and all of the muscles of the scapular region.
- _____ 10. The latissimus dorsi muscles have all of the following characteristics: inserts onto the lesser tubercle (tuberosity) and the intertubercular groove (sulcus) of the humerus after passing through the axilla; originate from the lower 6 thoracic vertebrae and all lumbar vertebrae, the thoracolumbar fascia, the lower 3 or 4 pairs of ribs and the inferior scapular angle; this muscle extends, adducts and medially rotates the humerus. It is innervated by the thoracodorsal nerve.
- _____ 11. The pectoralis major muscles have all of the following characteristics: originates from the clavicle, sternum and costal cartilages of ribs 2 through 6; inserts onto the greater tubercle (tuberosity) of the humerus; the whole muscle adducts and medially rotates the humerus; the clavicular head flexes and extends the humerus; the sternocostal head extends a flexed humerus; innervation is the medial and lateral pectoral nerves.
- _____ 12. The serratus anterior muscles have all of the following characteristics: origin on the upper 8 or 9 pairs of ribs; inserts onto the medial portion of the scapula after passing deep to the scapula; actions of abduction (protraction) of the scapula and upward rotation of the scapula. It is innervated by the long thoracic nerve.
- _____ 13. The deltoid muscles have all of the following characteristics: inserts onto the deltoid tuberosity, originates from the clavicle, acromion process and spine of the scapula; actions are abduction, flexion, medial rotation, extension and lateral rotation of the humerus; innervation is the axillary nerve.
- _____ 14. All of the scapular muscles (supraspinatus, infraspinatus, teres minor, teres major and subscapularis) have an insertion onto either the greater or lesser tuberosity (tubercle) of the humerus.
- _____ 15. All of the scapular muscles (supraspinatus, infraspinatus, teres minor, teres major and subscapularis) have an action on the humerus that is either medial or lateral rotation of the humerus.

- _____ 16. All of the flexor muscles of the arm are innervated by the musculocutaneous nerve.
- _____ 17. Both the coracobrachialis and the biceps brachii muscles have an origin on the coracoid process and an insertion somewhere on the humerus.
- _____ 18. All three muscles of the anterior compartment of the arm (biceps brachii, coracobrachialis and brachialis) have an action on the humerus.
- _____ 19. The triceps brachii muscles have all of the following characteristics: the long head originates from the supraglenoid tubercle (tuberosity) of the scapula; the medial and lateral heads both originate from the humerus; the insertion is the olecranon of the ulna; actions are extension and adduction of the humerus.

Section 4: Multiple Uglies dealing with the brachial plexus. Circle the letter in front of any and all true statements in the questions below. Each *total* question is worth the number of points indicated.

20. The brachial plexus (10 points)
- a. Damage to the ventral ramus of spinal nerve C6 would result in some form of damage to the radial nerve.
 - b. Damage to the ventral ramus of spinal nerve C5 would result in some form of damage to the axillary nerve.
 - c. Damage to the ventral ramus of spinal nerve C7 would result in some form of damage to the ulnar nerve.
 - d. Damage to the ventral ramus of spinal nerve C8 would result in some form of damage to the radial nerve.
 - e. Damage to the ventral ramus of spinal nerve C7 would result in some form of damage to the axillary nerve.
 - f. Damage to the ventral ramus of T1 would result in some form of damage to the median nerve
 - g. The ulnar nerve innervates nothing in the arm, two forearm flexors, and most of the muscles of the hand.
 - h. The median nerve innervates nothing in the arm, most forearm flexors, and some of the muscles of the hand.
 - i. The radial nerve innervates only the extensor muscles of the forearm.
 - j. The axillary nerve innervates the deltoid and teres minor muscles of the shoulder.

Section 5: Muscles of the anterior compartment of the forearm. Answer the following questions by placing the correct letter in the space provided. (2 points each)

- _____ 21. Which of the following *general* characteristics of the anterior compartment of the forearm is/are *incorrect*?
- The anterior compartment of the forearm may be divided into superficial, intermediate and deep compartments.
 - The primary actions of the anterior compartment muscles are flexion of the wrist, flexion of the fingers and lateral rotation of the radius around the ulna.
 - Superficial muscles originate from at least the medial epicondyle of the humerus and the muscles of the deeper compartments have origins that are either from the medial epicondyle of the humerus or from structures more distally located in the forearm.
 - These muscles are innervated by either the median or ulnar nerve.
 - More than one of the general characteristics listed above are incorrect.
- _____ 22. Which of the following is *not* a characteristic of the pronator teres?
- Origins from the medial epicondyle of the humerus and the coracoid process of the ulna
 - Insertion onto the radius
 - Actions are pronation (medial rotation) of the radius around the ulna and flexion of the forearm.
 - Innervation by the median nerve.
 - More than one of the above is not a characteristic of the pronator teres.
 - None of the above are characteristics of the pronator teres.
- _____ 23. Which of the following is *not* a characteristic of the flexor carpi radialis?
- Originates from the medial epicondyle of the humerus.
 - Inserts onto the 2nd and 3rd metacarpals.
 - Flexes the wrist and abducts the wrist.
 - Innervated by the ulnar nerve.
 - More than one of the above is not a characteristic of the flexor carpi radialis.
 - None of the above are characteristics of the flexor carpi radialis.
- _____ 24. Which of the following is a characteristic of the flexor digitorum superficialis?
- Originates from the medial epicondyle of the humerus, radius and the conoid tubercle of the ulna.
 - Inserts onto fingers 2 through 4.
 - Actions are flexion of the fingers and wrist.
 - Innervation is the median nerve.
 - Two of the above are characteristics of the flexor digitorum superficialis.
 - Three of the above are characteristics of the flexor digitorum superficialis.
 - All of the above are characteristic of the flexor digitorum superficialis.
 - None of the above are characteristics of the flexor digitorum superficialis.

- _____ 25. Which of the following muscles has at least one of its origins as the interosseous membrane found between the radius and ulna?
- Flexor digitorum superficialis
 - Flexor digitorum profundus
 - Flexor pollicis longus
 - Pronator quadratus
 - More than one of the above
 - All of the above
 - None of the above

Section 6: Muscles of the posterior compartment of the forearm. Answer the following questions by placing the correct letter in the space provided. (2 points each)

- _____ 26. Which of the following are *general* characteristics of the posterior compartment of the forearm?
- The posterior compartment of the forearm may be subdivided into superficial, intermediate and deep compartments.
 - All of the superficial compartment muscles have an origin on the lateral epicondyle of the humerus.
 - All of the deep compartment muscles have an origin on the radius and/or ulna.
 - All of the posterior compartment muscles are innervated by the radial nerve.
 - All of the posterior compartment muscles either extend the wrist, extend the fingers, laterally rotate the radius around the ulna, or have an action on the thumb.
 - More than one of the above are *general* characteristics of the posterior compartment of the forearm.
 - All but one of the above are *general* characteristics of the posterior compartment of the forearm.
 - All of the above are *general* characteristics of the posterior compartment of the forearm.
- _____ 27. Which of the following muscles has *at least one of its origins* on the interosseous membrane?
- brachioradialis
 - extensor carpi radialis longus
 - extensor carpi radialis brevis
 - extensor digitorum (communis)
 - extensor digit minimi
 - extensor carpi ulnaris
 - supinator
 - abductor pollicis longus
 - extensor pollicis brevis
 - extensor pollicis longus
 - extensor indicis
 - more than one of the above
 - none of the above

- _____ 28. Which of the following muscles has abduction of the wrist as *at least one of its actions*?
- brachioradialis
 - extensor carpi radialis longus
 - extensor carpi radialis brevis
 - extensor digitorum (communis)
 - extensor digit minimi
 - extensor carpi ulnaris
 - supinator
 - abductor pollicis longus
 - extensor pollicis brevis
 - extensor pollicis longus
 - extensor indicis
 - more than one of the above
 - none of the above
- _____ 29. Which of the following muscles has medial rotation of the radius around the ulna *as at least one of its actions*?
- brachioradialis
 - extensor carpi radialis longus
 - extensor carpi radialis brevis
 - extensor digitorum (communis)
 - extensor digit minimi
 - extensor carpi ulnaris
 - supinator
 - abductor pollicis longus
 - extensor pollicis brevis
 - extensor pollicis longus
 - extensor indicis
 - more than one of the above
 - none of the above
- _____ 30. Which of the following muscles has *at least one of its insertions* on the pisiform bone?
- brachioradialis
 - extensor carpi radialis longus
 - extensor carpi radialis brevis
 - extensor digitorum (communis)
 - extensor digit minimi
 - extensor carpi ulnaris
 - supinator
 - abductor pollicis longus
 - extensor pollicis brevis
 - extensor pollicis longus
 - extensor indicis
 - more than one of the above
 - none of the above

- _____ 31. Which of the muscles has the 5th metacarpal *as at least one of its insertions?*
- brachioradialis
 - extensor carpi radialis longus
 - extensor carpi radialis brevis
 - extensor digitorum (communis)
 - extensor digit minimi
 - extensor carpi ulnaris
 - supinator
 - abductor pollicis longus
 - extensor pollicis brevis
 - extensor pollicis longus
 - extensor indicis
 - more than one of the above
 - none of the above
- _____ 32. Which of the muscles has the 1st metacarpal *as at least one of its insertions?*
- brachioradialis
 - extensor carpi radialis longus
 - extensor carpi radialis brevis
 - extensor digitorum (communis)
 - extensor digit minimi
 - extensor carpi ulnaris
 - supinator
 - abductor pollicis longus
 - extensor pollicis brevis
 - extensor pollicis longus
 - extensor indicis
 - more than one of the above
 - none of the above
- _____ 33. Which of the following muscles has extension of the thumb *as at least one of its actions?*
- brachioradialis
 - extensor carpi radialis longus
 - extensor carpi radialis brevis
 - extensor digitorum (communis)
 - extensor digit minimi
 - extensor carpi ulnaris
 - supinator
 - abductor pollicis longus
 - extensor pollicis brevis
 - extensor pollicis longus
 - extensor indicis
 - more than one of the above
 - none of the above

- _____ 34. Which of the following muscles has *one or more of its origins* on the ulna?
- brachioradialis
 - extensor carpi radialis longus
 - extensor carpi radialis brevis
 - extensor digitorum (communis)
 - extensor digiti minimi
 - extensor carpi ulnaris
 - supinator
 - abductor pollicis longus
 - extensor pollicis brevis
 - extensor pollicis longus
 - extensor indicis
 - more than one of the above
 - none of the above

Think Questions — Ability to interpret / use information discussed in class

Section 7: Agonist – Antagonist – Synergistic roles

- _____ 35. Think about the actions of the pronator teres. Which of the following muscles would have *at least one action* that would be antagonistic to one or more of the actions of the pronator teres?
- brachioradialis
 - pronator quadratus
 - flexor carpi radialis
 - flexor carpi ulnaris
 - flexor digitorum superficialis
 - palmaris longus
 - two of the above
 - three of the above
 - none of the above
- _____ 36. Think about the actions of the serratus anterior. Which of the following muscles would have *at least one action* that would be antagonistic to one or more of the actions of the serratus anterior?
- trapezius
 - latissimus dorsi
 - rhomboid major
 - rhomboid minor
 - two of the above
 - three of the above
 - all of the above
 - none of the above

- _____ 37. Think of the actions of the pectoralis major. Which of the following muscles would have *at least one action* that would be antagonistic to one or more of the actions of the pectoralis major?
- a. coracobrachialis
 - b. deltoid
 - c. infraspinatus
 - d. teres minor
 - e. teres major
 - f. two of the above
 - g. three of the above
 - h. four of the above
 - i. all of the above
 - k. none of the above
- _____ 38. Think of the actions of the brachioradialis. Which of the following muscles would have *at least one action* that would be antagonistic to one or more of the actions of the brachioradialis?
- a. pronator teres
 - b. palmaris longus
 - c. biceps brachii
 - d. flexor digitorum superficialis
 - e. two of the above
 - f. three of the above
 - g. all of the above
 - h. none of the above
- _____ 39. Think of the actions of the flexor carpi radialis. Which of the following muscles would have *at least one action* that would be antagonistic to one or more of the actions of the flexor carpi radialis?
- a. flexor carpi ulnaris
 - b. extensor carpi ulnaris
 - c. extensor carpi radialis longus
 - d. extensor carpi radialis brevis
 - f. abductor pollicis longus
 - g. two of the above
 - h. three of the above
 - k. four of the above
 - l. all of the above
 - m. none of the above

- _____ 40. Think of the actions of the flexor digitorum superficialis. Which of the following muscles would have *at least one action* that would be antagonistic to one or more of the actions of the flexor digitorum superficialis.
- extensor digitorum
 - extensor carpi radialis longus
 - extensor carpi radialis brevis
 - extensor carpi ulnaris
 - two of the above
 - three of the above
 - all of the above
 - none of the above
- _____ 41. OK — I must be getting soft in my old age. Draw your best picture of a jack-o-lantern in the space provided.
- _____ 42. If you wanted to stabilize the scapula and prevent an undesired action which of the following muscles *wouldn't* you contract?
- trapezius
 - rhomboideus major
 - rhomboideus minor
 - latissimus dorsi
 - pectoralis minor
 - you wouldn't contract more than one of the above muscles
 - you wouldn't contract any of the above muscles
- _____ 43. Maximum range of motion (ROM) of the humerus is supported by appropriate movements of the scapula. Which of the following muscles would you contract to abduct the humerus and maximize the ROM of the humerus?
- deltoid and latissimus dorsi
 - deltoid and rhomboideus major and rhomboideus minor
 - pectoralis major and pectoralis minor
 - supraspinatus, deltoid and trapezius
 - supraspinatus, deltoid and pectoralis minor
- _____ 44. Maximum range of motion (ROM) of the humerus is supported by appropriate movements of the scapula. Which of the following muscles would you contract to adduct the humerus and maximize the ROM of the humerus?
- teres minor and teres major
 - deltoid and latissimus dorsi
 - deltoid and rhomboideus major and rhomboideus minor
 - pectoralis major and rhomboideus major and rhomboideus minor
 - pectoralis minor and supraspinatus

- _____ 45. Flexion of the wrist may be accompanied by unintentional movements of the fingers and hand. Which of the following muscles would you contract to flex the wrist and prevent undesired movements of the wrist?
- flexor carpi radialis and flexor carpi ulnaris
 - palmaris longus and extensor digitorum (communis)
 - flexor digitorum superficialis and extensor digitorum (communis)
 - extensor digiti minimi and palmaris longus
- _____ 46. Flexion of the fingers may be accompanied by unintentional flexion of the wrist. Which of the following muscles would you contract to flex the fingers and simultaneously preventing an undesired flexion of the wrist?
- flexor digitorum superficialis, flexor digitorum profundus, extensor digitorum (communis)
 - flexor digitorum superficialis, flexor digitorum profundus, extensor digitorum (communis), flexor carpi radialis and flexor carpi ulnaris
 - flexor digitorum superficialis, flexor digitorum profundus, extensor carpi ulnaris, extensor carpi radialis longus, extensor carpi radialis brevis
 - more than one of the above

Section 8: Answer the following question in the space provided.

47. What is the user name that you have to type in to log into Cyber Anatomy?
(3 points)
48. What is the password that you have to type in to log into Cyber Anatomy?
(3 points)