

LABORATORY ACTIVITY NO. 7

THE MUSCULAR SYSTEM

Scope of Laboratory Activity

This laboratory activity consists of four (4) worksheets:

- Worksheet no. 1 Comparison of Skeletal, Cardiac and Smooth Muscles
- Worksheet no. 2 Skeletal Muscle Fibers
- Worksheet no. 3 Sarcomere Structure
- Worksheet no. 4 The Major Muscles of the Human Body

Overview

The muscular systems serves to move the body. Without the muscle, the jaw would sag, the eyelids would drop and breathing could stop. Muscles keep us alive!

We have a total of 700 skeletal muscle and you will explore the type of muscle tissue covering the body, recognize how motion or movement develops and examine the major skeletal muscles in details.

Objectives

After completing this laboratory activity, the student will be able to:

1. Describe the different characteristics of skeletal, cardiac and smooth muscles
2. Identify skeletal muscle fibers
3. Identify the sarcomere structure
4. Identify the major muscles in the human body.

Materials

Compound microscope
Slides of striated, smooth and cardiac muscles
Anatomic charts of skeletal muscles
Models of skeletal muscles

Worksheet no. 1 Comparison of Skeletal, Cardiac and Smooth Muscles

Complete the Chart below comparing the types of muscles according its characteristics

Characteristics	Skeletal	Cardiac	Smooth
Body Location	Attached to bones or, for some facial muscles, to skin		
Cell shape and appearance		Branching chains of cells; uninucleate, striations; intercalated discs	
Connective tissue components			Endomysium
Regulation of contraction		Involuntary; the heart has a pacemaker; also nervous system controls; hormones	Involuntary; nervous system controls; hormones, chemicals, stretch
Speed of contraction	Slow to fast		
Rhythmic contraction			Yes, In some

Worksheet no.2 Skeletal Muscle Fibers

Label the skeletal muscle fibers in Figure 1

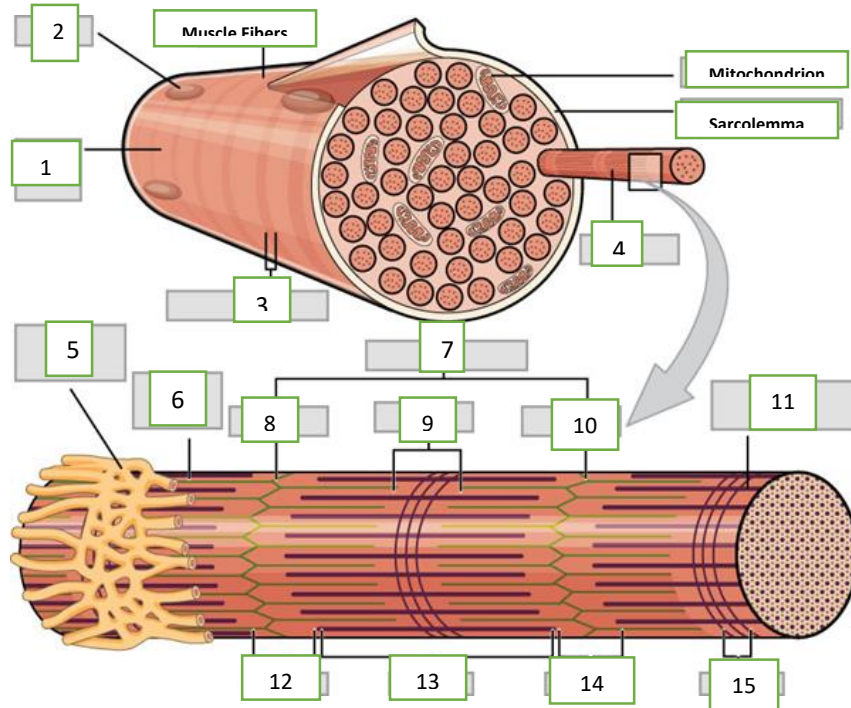


Figure 1 Muscle Fibers

- | | |
|----------|-----------|
| 1. _____ | 9. _____ |
| 2. _____ | 10. _____ |
| 3. _____ | 11. _____ |
| 4. _____ | 12. _____ |
| 5. _____ | 13. _____ |
| 6. _____ | 14. _____ |
| 7. _____ | 15. _____ |
| 8. _____ | |

Worksheet no.3 Sarcomere Structure

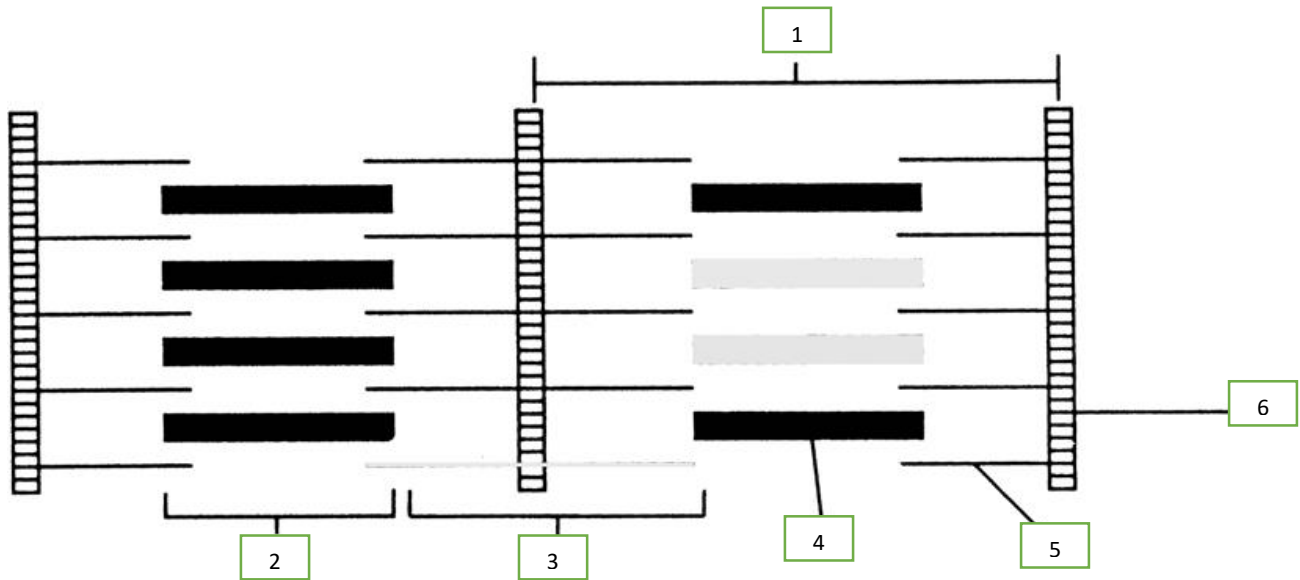


Figure 2 Sarcomere

- | | |
|----------|----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | 6. _____ |

Questions for Sarcomere Structure

1. Do the length of the thin or thick filaments change when a muscle contracts? Explain.

2. Does the A band length change when a muscle contract? Explain

3. Does the I band length change when a muscle contracts?

Worksheet no.3 The Major Muscles of the Human Body

REVIEW MUSCLE LOCATION AND ACTION.

IDENTIFY THE MUSCLES in Figures 3 to Figure 14.2 and write your answers in the space provided

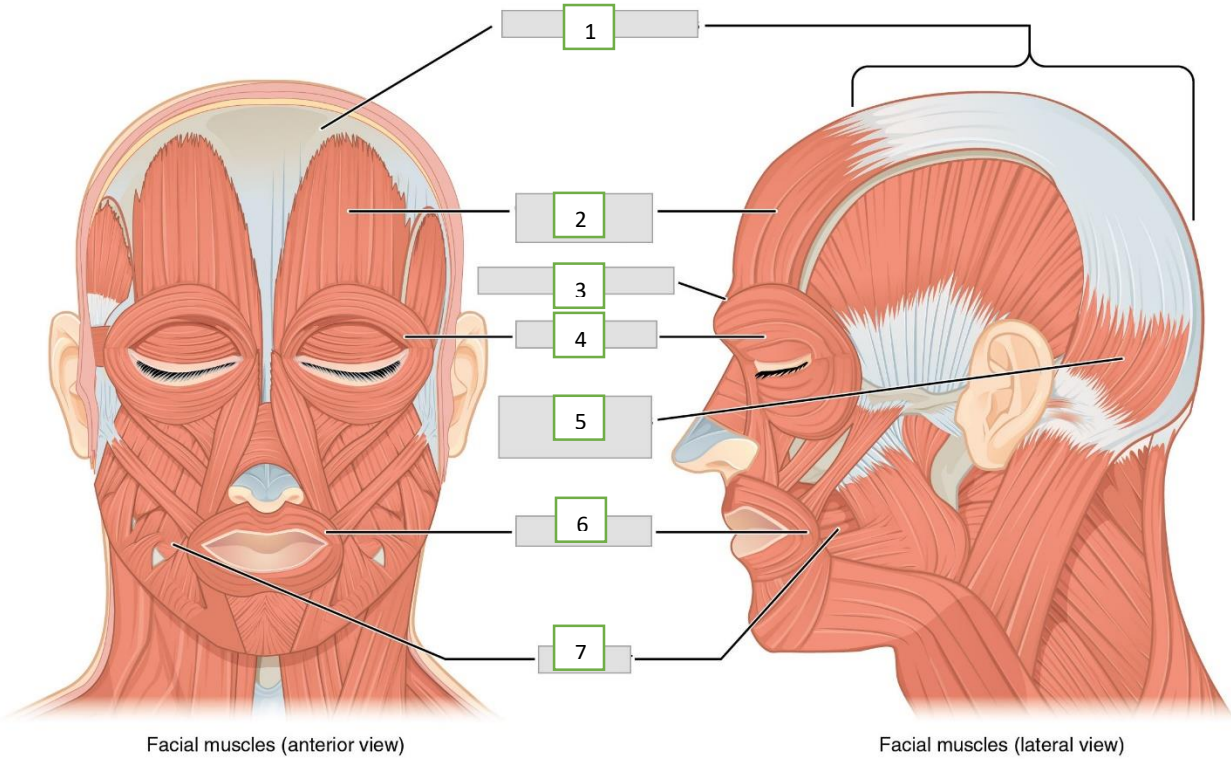


Figure 3 Muscles of Facial Expression

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | |

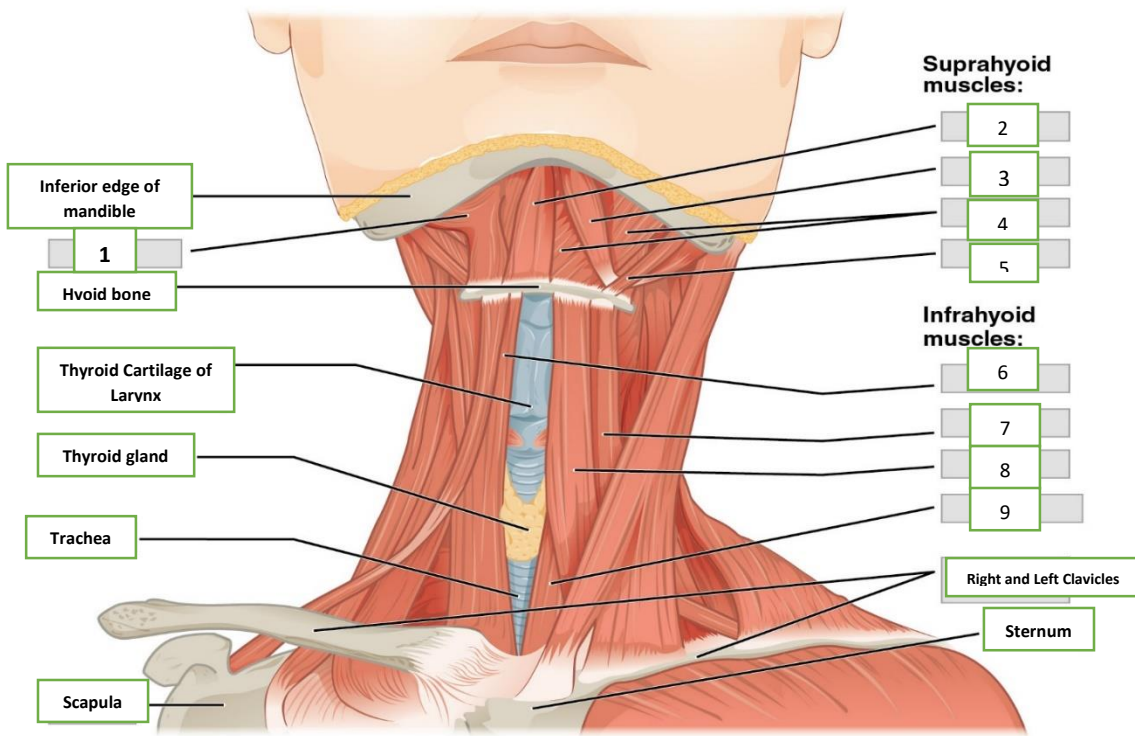


Figure 4 Muscles of the Anterior Neck

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

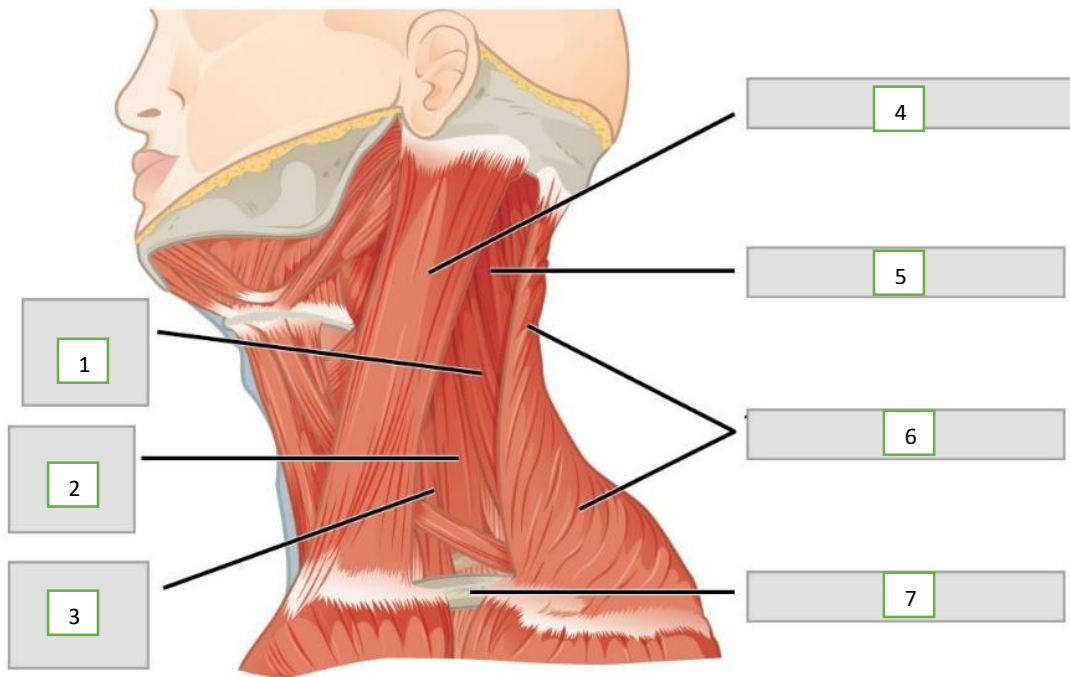


Figure 5 Left Lateral View of Neck Muscles

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | |

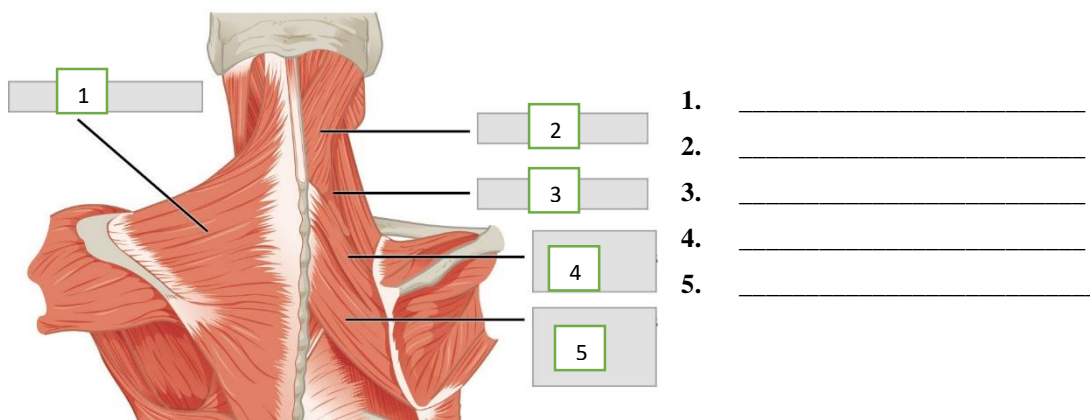


Figure 5.1 Superficial (left side) and deep (right side) Muscles of the neck and upper back (posterior view)

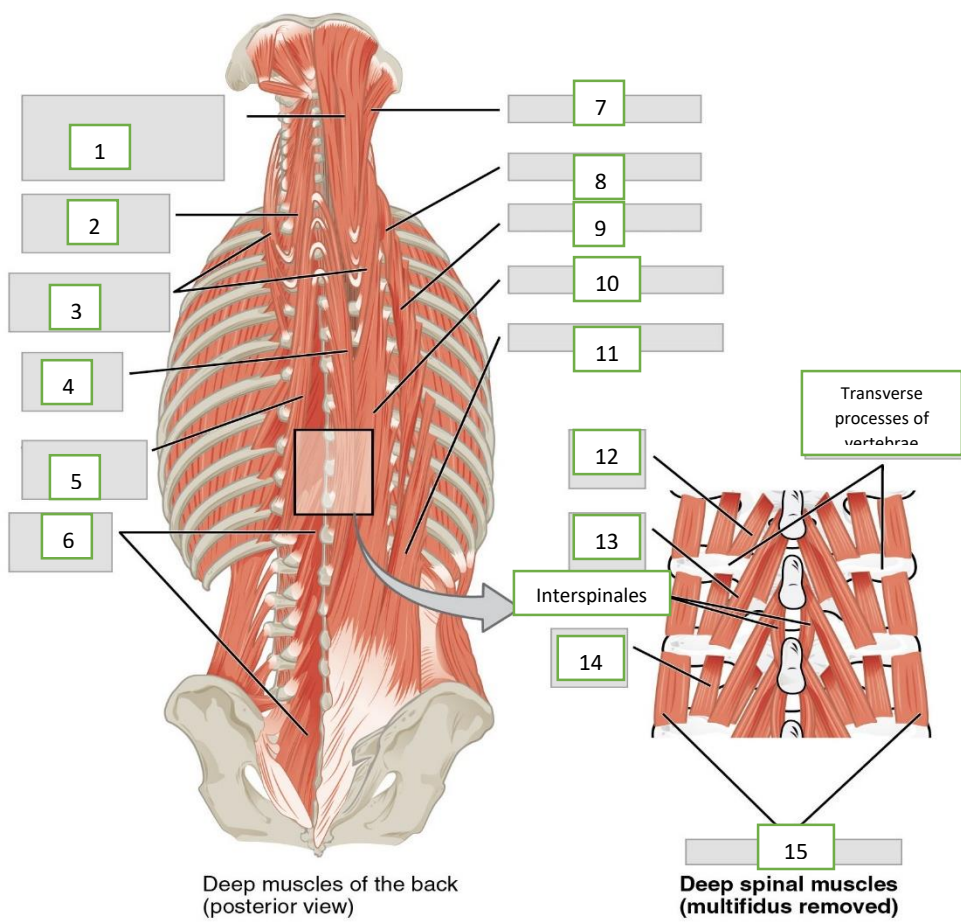


Figure 6 Posterior view of the Back Muscles

- | | |
|----------|-----------|
| 1. _____ | 9. _____ |
| 2. _____ | 10. _____ |
| 3. _____ | 11. _____ |
| 4. _____ | 12. _____ |
| 5. _____ | 13. _____ |
| 6. _____ | 14. _____ |
| 7. _____ | 15. _____ |
| 8. _____ | |

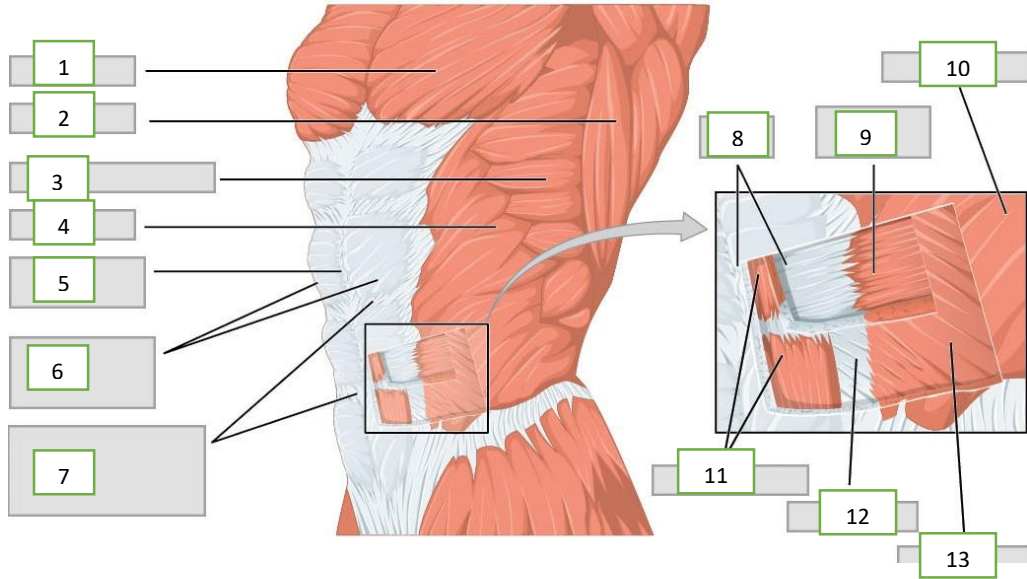
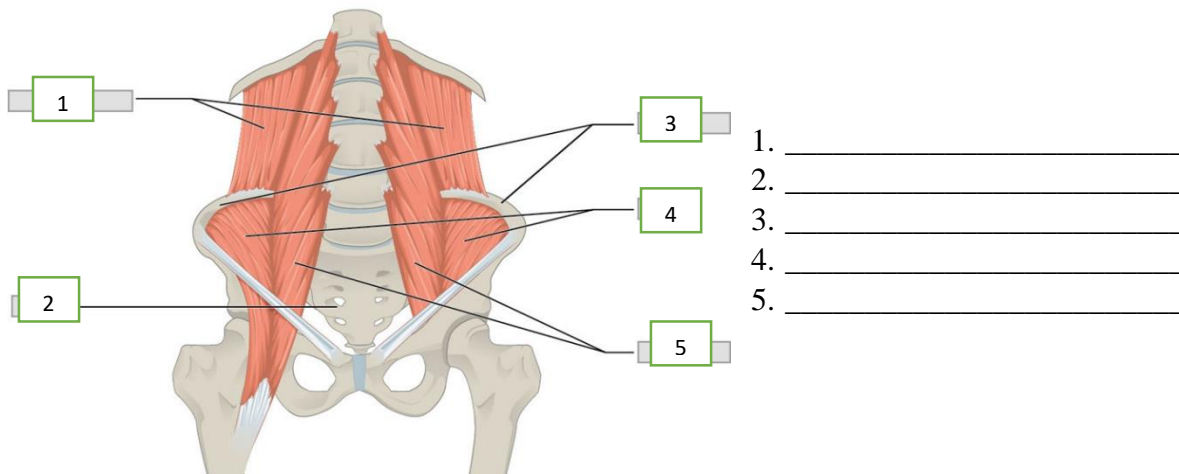


Figure 7 Muscles of the Abdomen

- | | |
|----------|-----------|
| 1. _____ | 8. _____ |
| 2. _____ | 9. _____ |
| 3. _____ | 10. _____ |
| 4. _____ | 11. _____ |
| 5. _____ | 12. _____ |
| 6. _____ | 13. _____ |
| 7. _____ | |



- | |
|----------|
| 1. _____ |
| 2. _____ |
| 3. _____ |
| 4. _____ |
| 5. _____ |

Figure 7.1 Posterior abdominal muscles (anterior view)

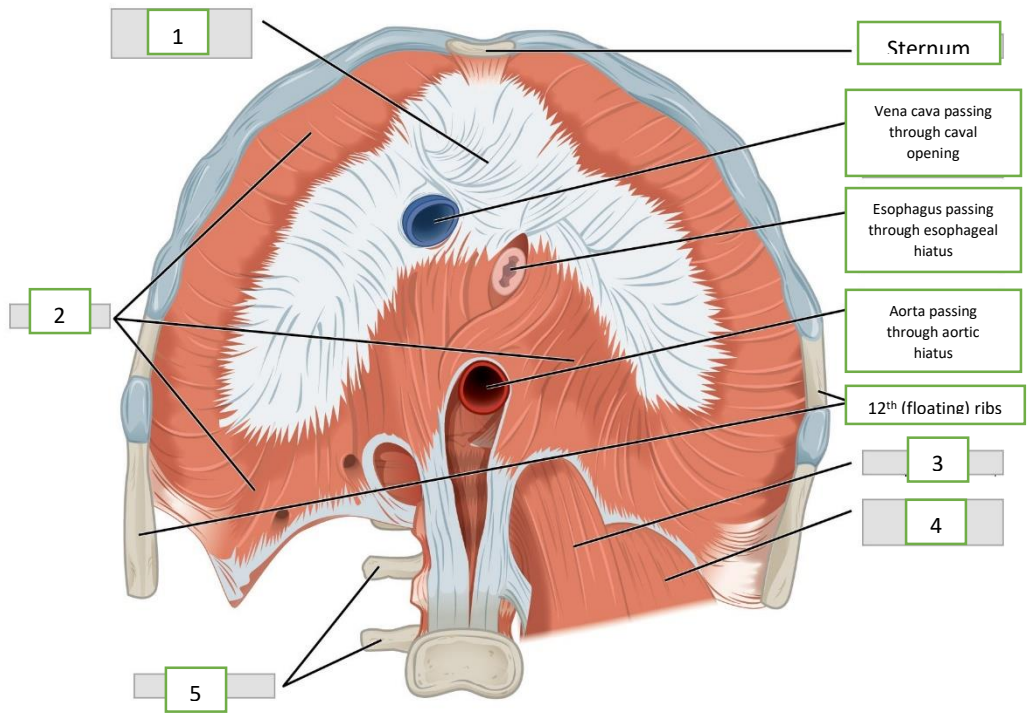


Figure 7.2 Diaphragm (inferior view)

1. _____
2. _____
3. _____
4. _____
5. _____

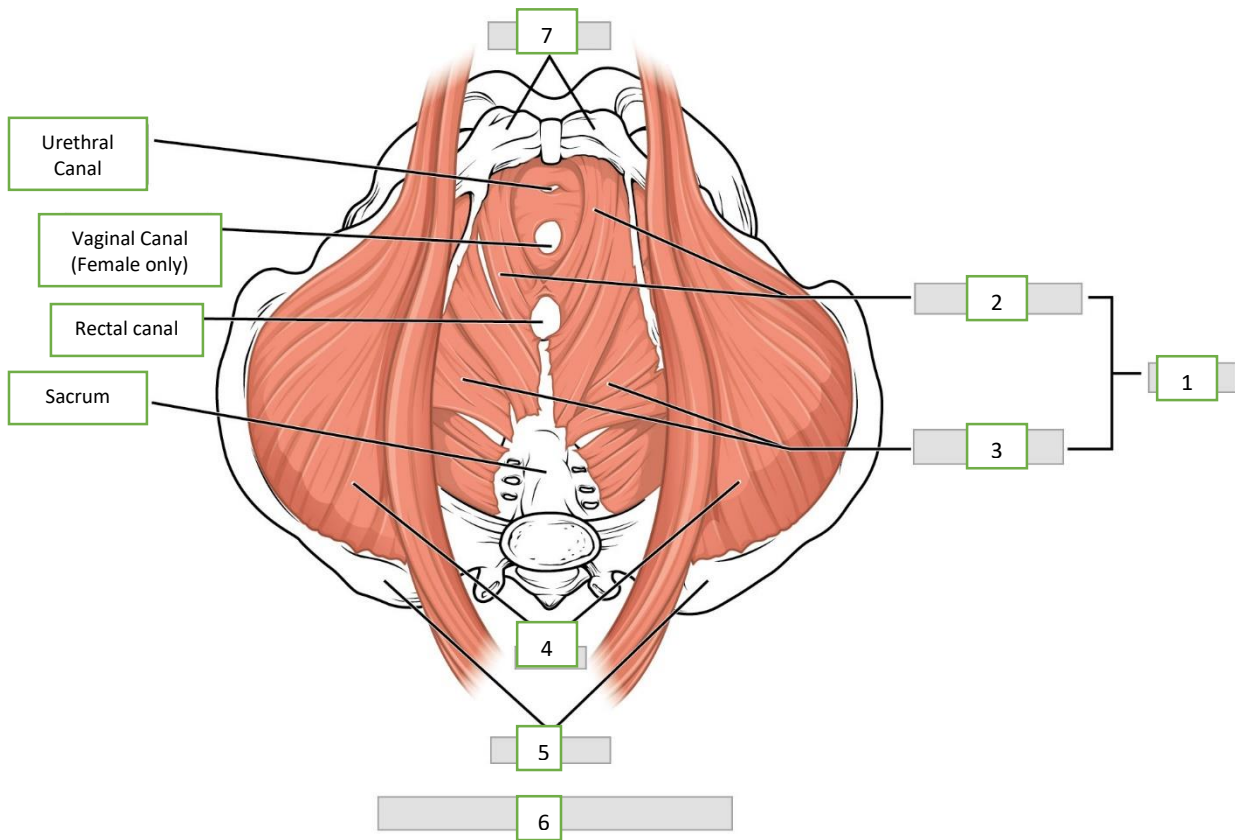
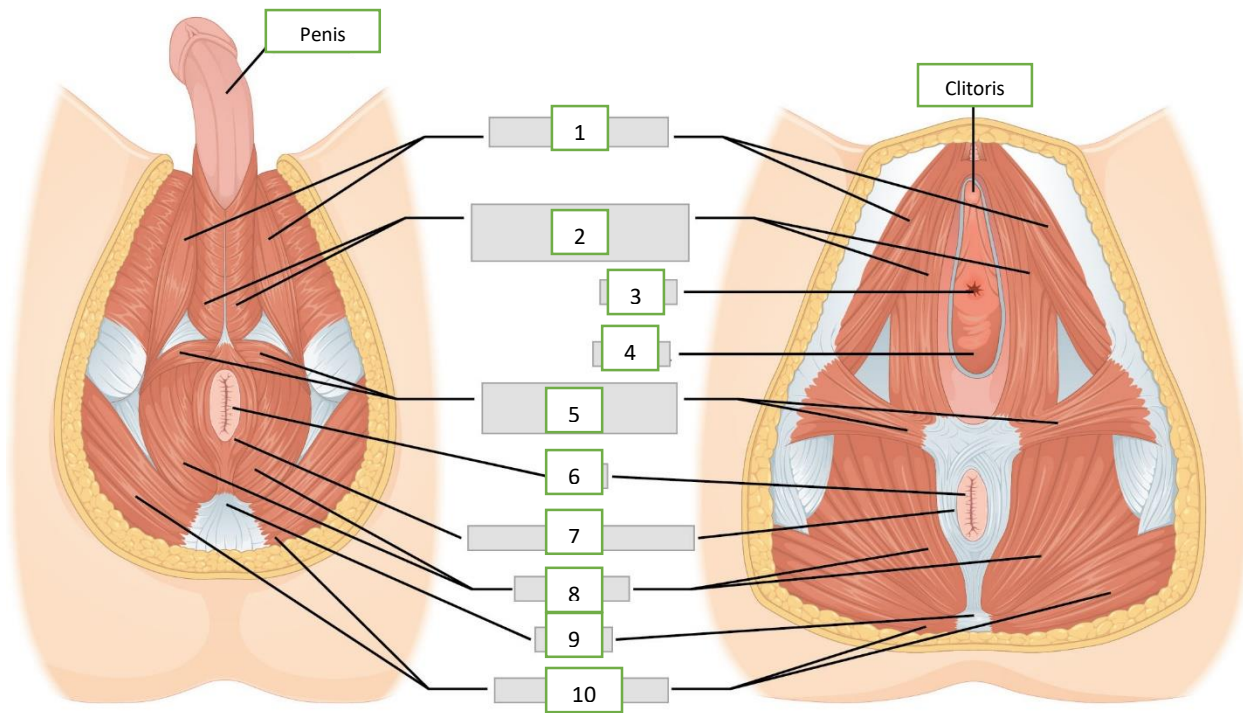


Figure 8 Muscles of the Pelvic Floor

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

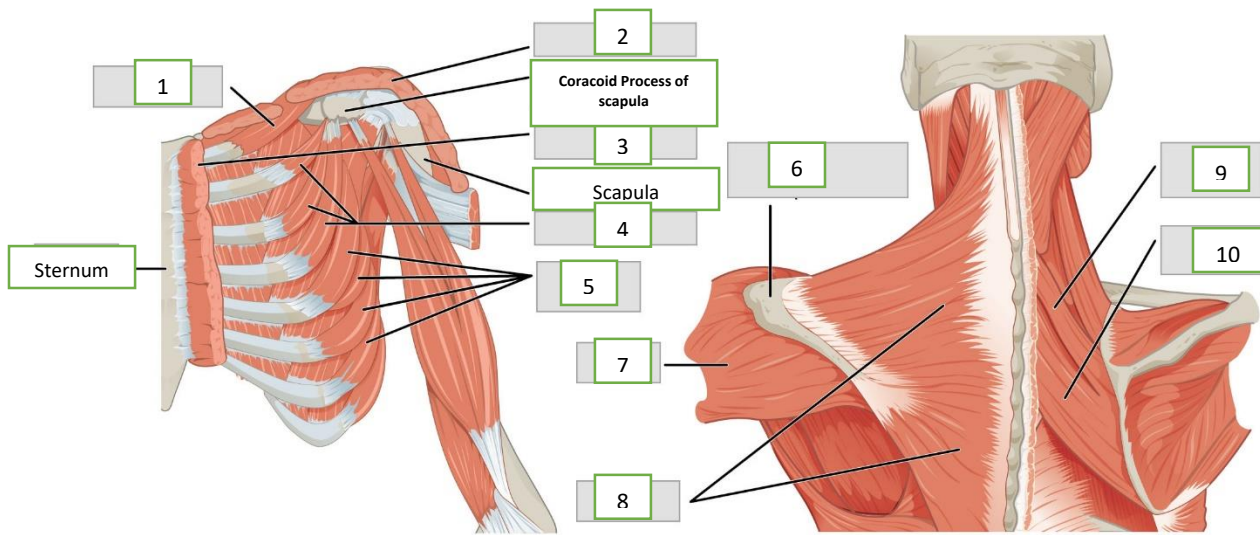


Male perineal muscles: inferior view

Female perineal muscles: inferior view

Figure 9 Muscles of the Pelvic Floor

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |



Pectoral girdle muscle (left anterior lateral view)

Pectoral girdle muscles (posterior view)

Figure 10 Muscles That Position the Pectoral Girdle

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

- 6. _____
- 7. _____
- 8. _____
- 9. _____
- 10. _____

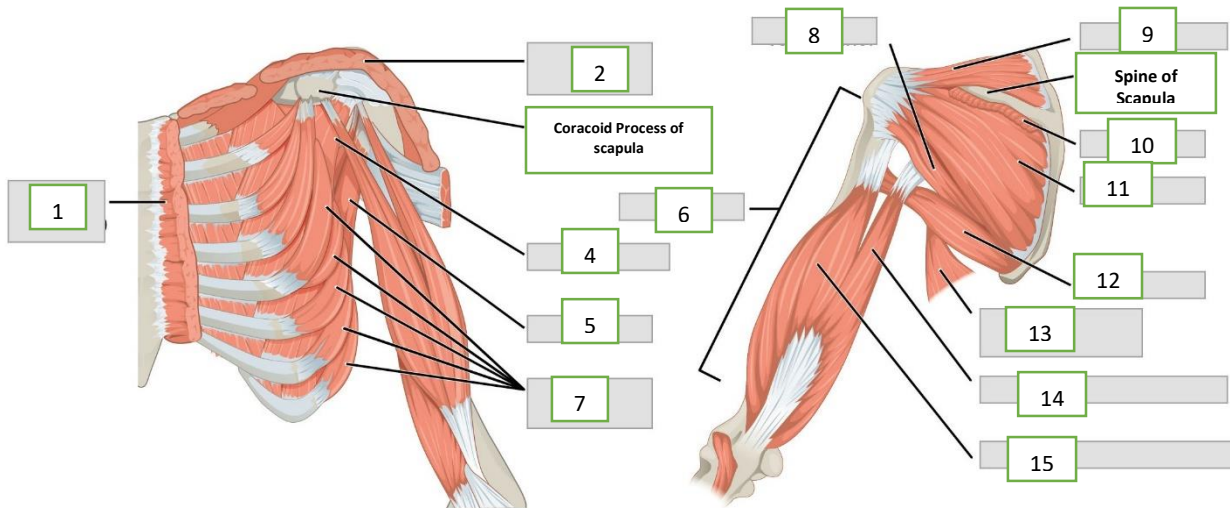


Figure 11 Muscles That Move the Humerus

- | | |
|----------|-----------|
| 1. _____ | 9. _____ |
| 2. _____ | 10. _____ |
| 3. _____ | 11. _____ |
| 4. _____ | 12. _____ |
| 5. _____ | 13. _____ |
| 6. _____ | 14. _____ |
| 7. _____ | 15. _____ |
| 8. _____ | |

Figure 12 Muscles that move the forearm

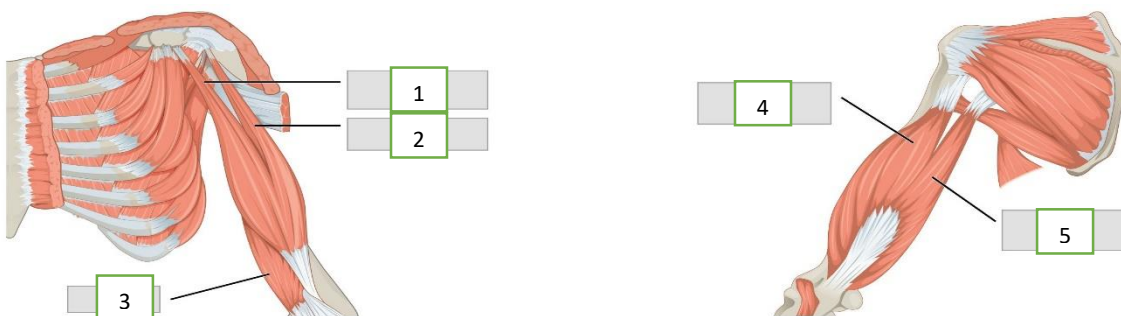
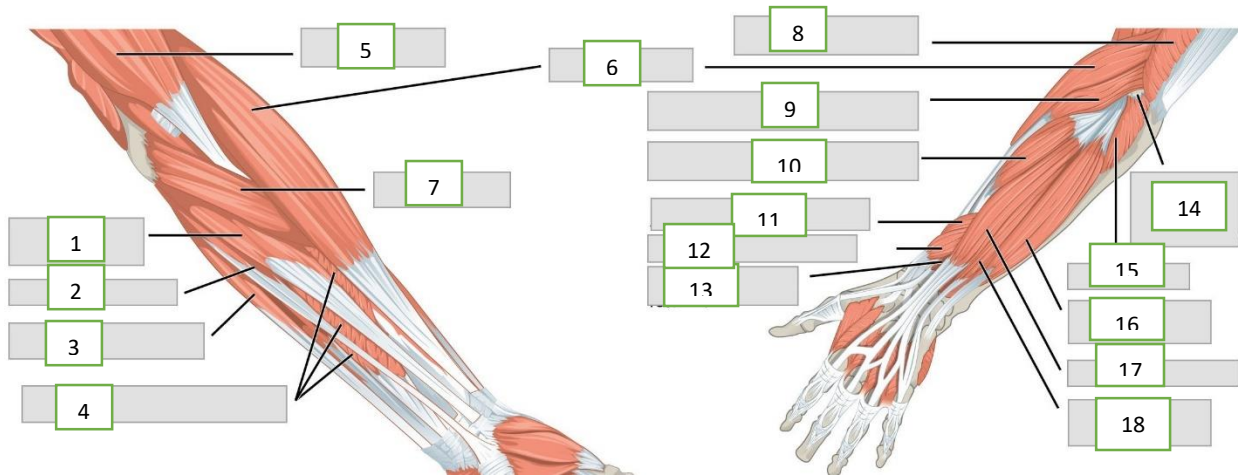


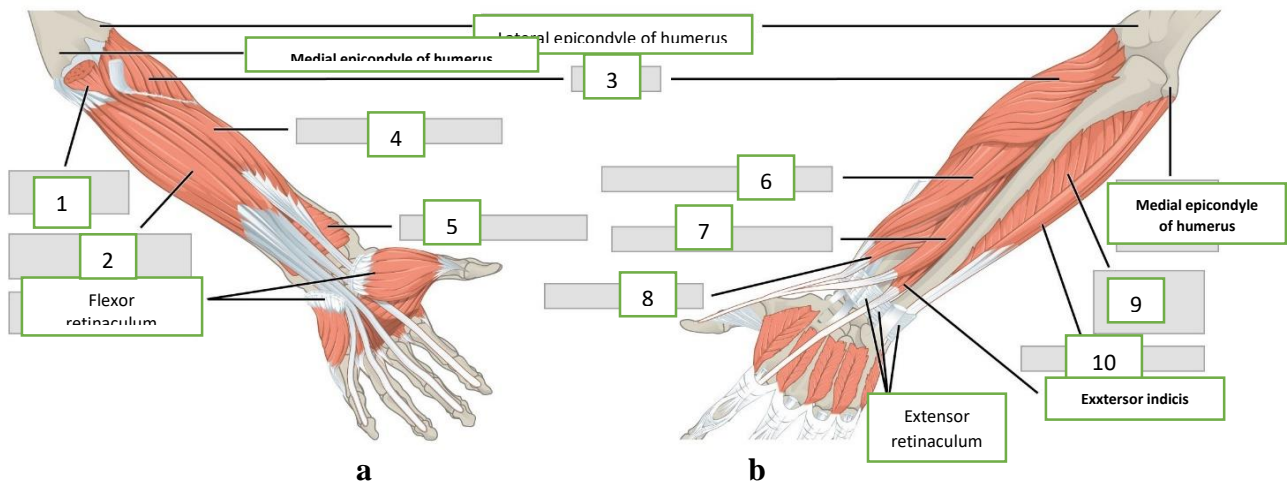
Figure 12.1 Lateral upper arm muscles and Left upper arm muscles

- | | |
|----------|----------|
| 1. _____ | 4. _____ |
| 2. _____ | 5. _____ |
| 3. _____ | |



a **b**
Figure 12.2 Left forearm superficial muscles and Left forearm superficial muscles

- | | |
|----------|-----------|
| 1. _____ | 10. _____ |
| 2. _____ | 11. _____ |
| 3. _____ | 13. _____ |
| 4. _____ | 14. _____ |
| 5. _____ | 15. _____ |
| 6. _____ | 16. _____ |
| 7. _____ | 17. _____ |
| 8. _____ | 18. _____ |
| 9. _____ | |



a **b**
Figure 12.3 (a) Left forearm deep muscles and (b) Left forearm deep muscles

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Figure 13 Muscles that Move the Wrist, Hand and Fingers

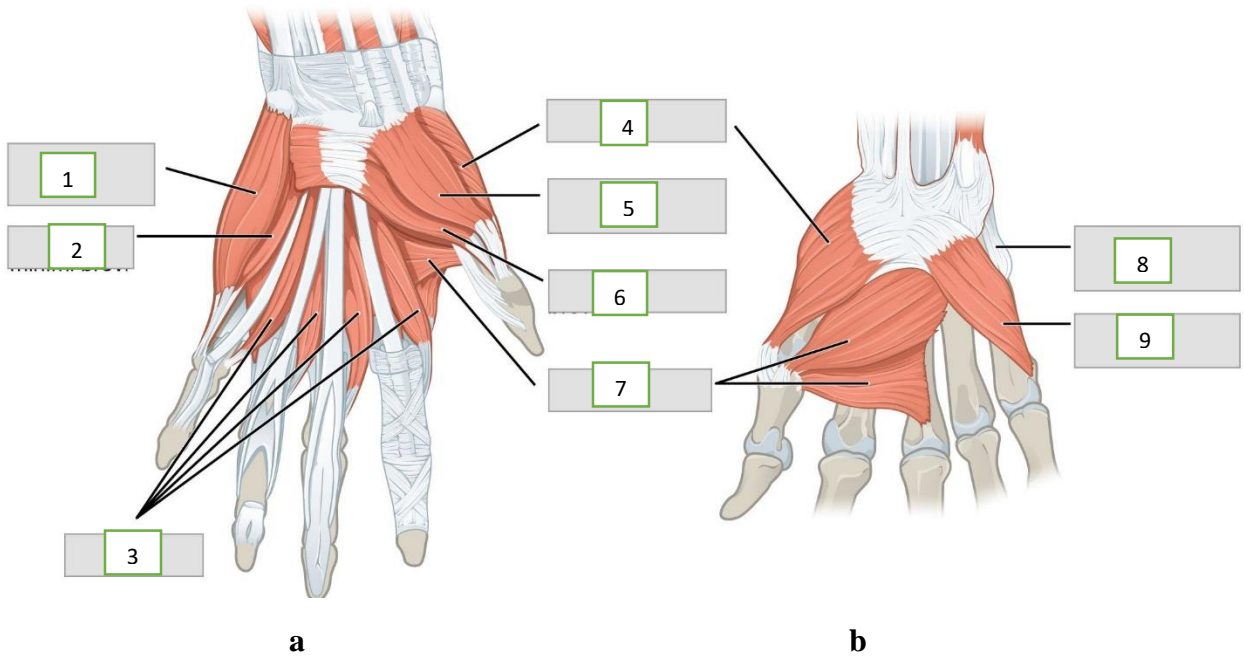


Figure 13.1 (a) Superficial muscles of left hand (palmar) and (b) Deep muscles of left hand (dorsal view)

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

- 6. _____
- 7. _____
- 8. _____
- 9. _____

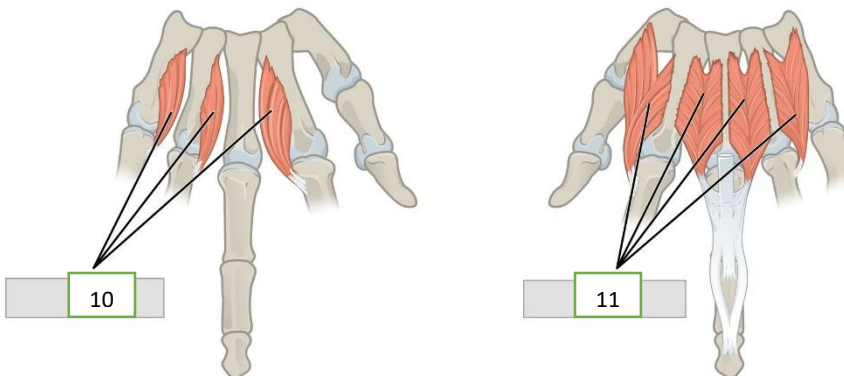


Figure 13.2 Interossei muscles of left hand palmar view and dorsal view

- 10. _____

- 11. _____

Figure 14 Muscles of the Thigh

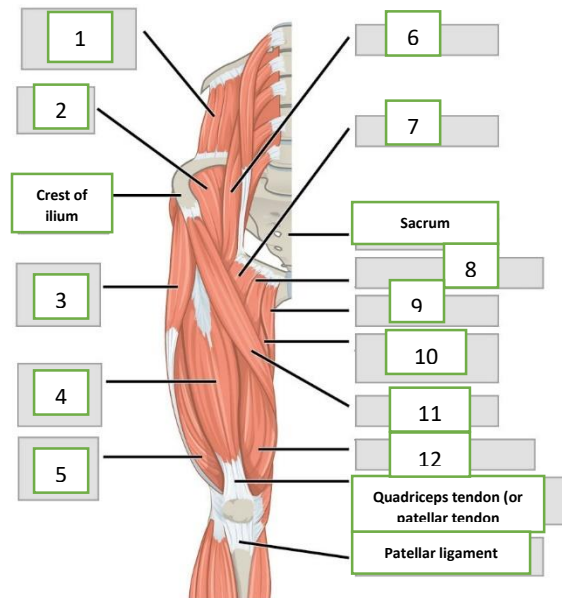


Figure 14.1 Superficial pelvic and thigh muscles of right leg (anterior view)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

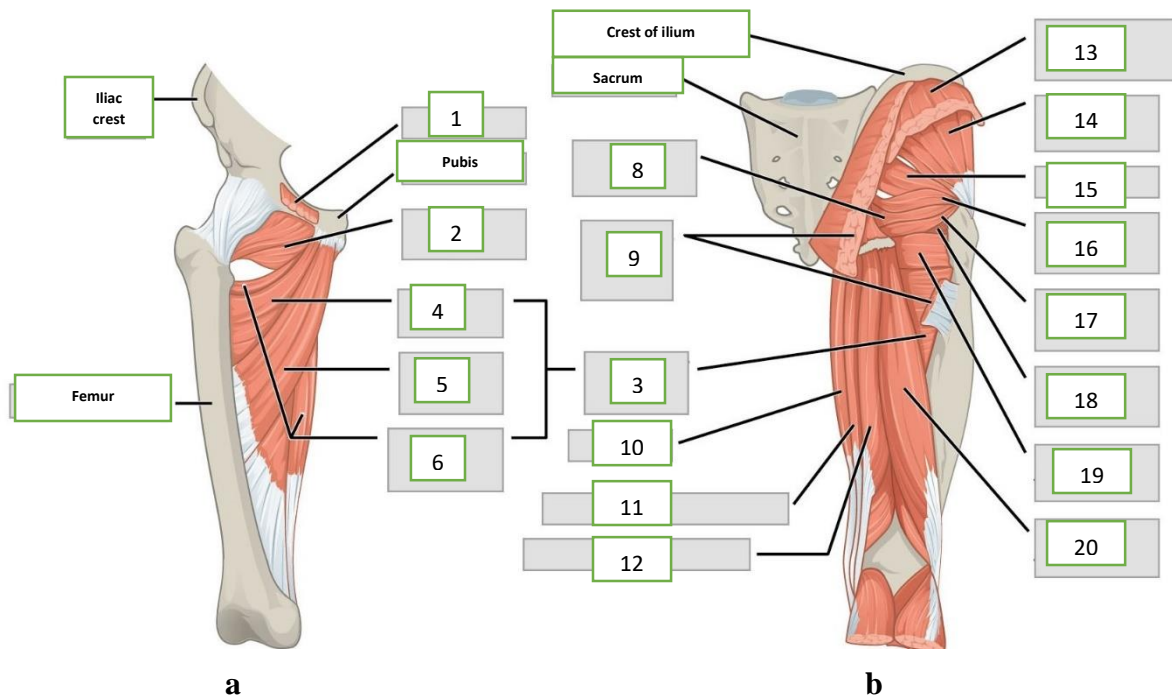


Figure 14.2 (a)Deep pelvic and thigh muscles of right leg (anterior view) and (b)Pelvic and thigh muscles of right leg (posterior view)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

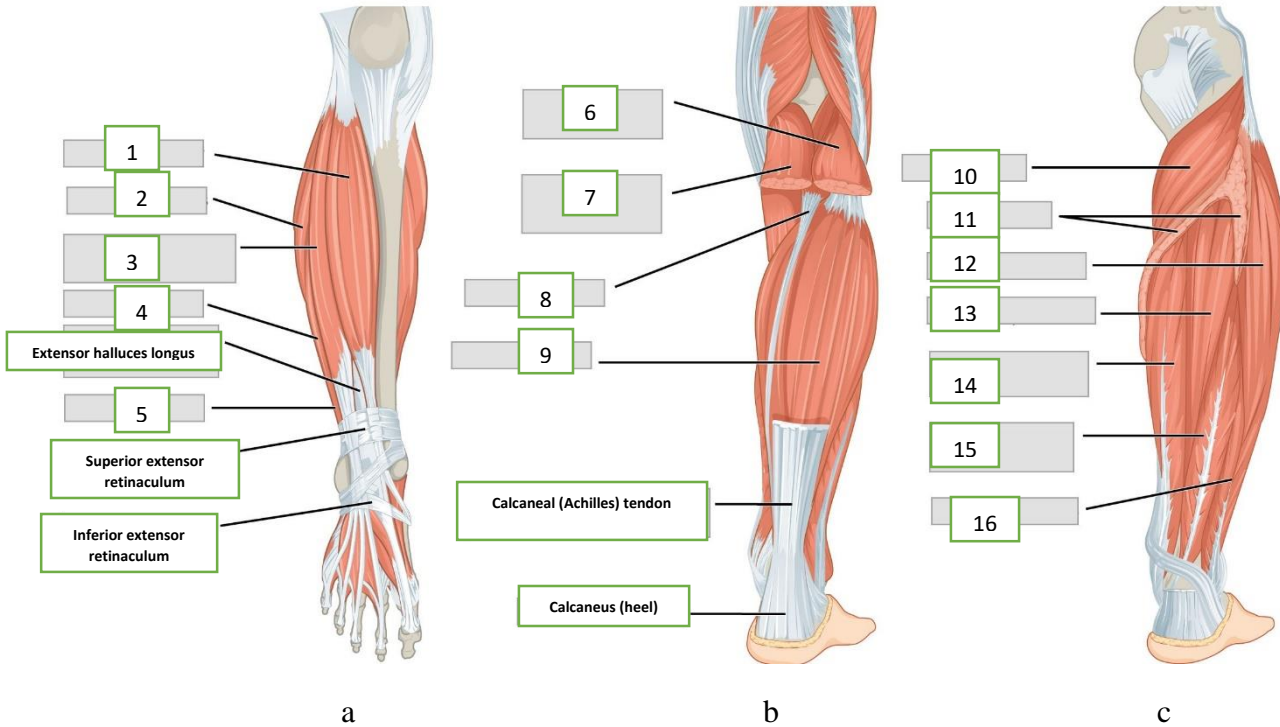


Figure 15 Superficial muscles of the right lower leg (a) anterior view and (b) posterior view (c) Deep muscles of the right lower leg (posterior view)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____

Figure 16 Muscles that move the feet and toes



Figure 16.1 Dorsal superficial muscles of the right foot (lateral view)

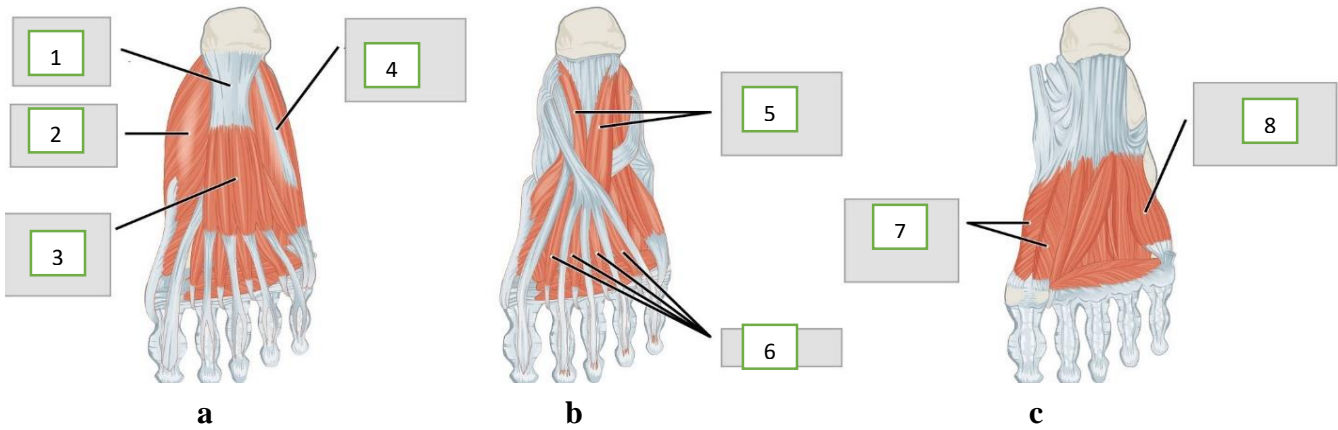


Figure 16.2 (a) Superficial muscles of the left sole (plantar view), (b) Intermediate muscles of the left sole (plantar view), (c) Deep muscles of the left sole (plantar view)

- 1. _____
- 2. _____
- 3. _____
- 4. _____

- 5. _____
- 6. _____
- 7. _____
- 8. _____

YOU MAY NOW PROCEED TO THE NEXT LABORATORY ACTIVITY



References

Images adapted

Figure 1, Figure 3 to Figure 16.2 OpenStax (2017) Anatomy and Physiology

Marieb, Elaine.(2002). Anatomy & Physiology Coloring Workbook 6th Edition. Pearson Education Asia Pte.Ltd