Lab 10: Muscle Tissue and Selected Muscles

Unit 7: Muscle Tissue & Muscular System (p. 153-180)

Ex. 7-1: Skeletal Muscle Anatomy & Muscle Tissue, p. 161

Muscle Tissue

<table>
<thead>
<tr>
<th>Skeletal muscle:</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Skeletal muscle sketch" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cardiac muscle:</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Cardiac muscle sketch" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smooth muscle</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Smooth muscle sketch" /></td>
</tr>
</tbody>
</table>
MUSCLE LIST

Locate these muscles on models, charts in the lab and on the APR on the computer. Know the origin, insertion and action for each of the following muscles:

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Temporalis</td>
<td>temporal bone</td>
<td>Coronoid process of mandible</td>
<td>closes jaw</td>
</tr>
<tr>
<td></td>
<td>[mastication]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Orbicularis oris</td>
<td>maxilla, mandible</td>
<td>Lips</td>
<td>Closes and protrudes lips for speaking, kissing, whistling</td>
</tr>
<tr>
<td></td>
<td>[facial expression]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Lateral rectus</td>
<td>tendinous ring of eye orbit</td>
<td>lateral eyeball</td>
<td>moves eye laterally</td>
</tr>
<tr>
<td></td>
<td>[extrinsic eye muscle]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Sternocleidomastoid</td>
<td>sternum and clavicle</td>
<td>mastoid process</td>
<td>flexes neck forward (if both contract)</td>
</tr>
<tr>
<td></td>
<td>[neck]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Deltoid</td>
<td>acromion process &amp; spine of scapula, clavicle</td>
<td>deltoid tuberosity (humerus)</td>
<td>flexion, abduction &amp; extension of arm</td>
</tr>
<tr>
<td></td>
<td>[shoulder joint]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Trapezius</td>
<td>occipital bone, spinous processes-thoracic vert.</td>
<td>clavicle, scapula (acromion process and spine)</td>
<td>elevate, retract, depress scapula</td>
</tr>
<tr>
<td></td>
<td>[posterior shoulder]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Triceps Brachii</td>
<td>scapula, inferior to glenoid cavity; posterior surface of humerus</td>
<td>Olecranon process of ulna</td>
<td>extension of forearm</td>
</tr>
<tr>
<td></td>
<td>[posterior arm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Rectus abdominis</td>
<td>pubic symphysis</td>
<td>Xiphoid process; costal cartilges of ribs 5-7</td>
<td>Flexion of vertebral column</td>
</tr>
<tr>
<td></td>
<td>[abdominal wall]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Gluteus maximus</td>
<td>ilium, sacrum, coccyx</td>
<td>fascia lata (iliotibial tract)</td>
<td>hip extension (climb stairs)</td>
</tr>
<tr>
<td></td>
<td>[gluteal region]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Gastrocnemius</td>
<td>condyles of femur</td>
<td>Calcaneus (via calcaneal tendon)</td>
<td>Plantar flexion of foot; flexion of knee</td>
</tr>
<tr>
<td></td>
<td>[leg muscle]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Bio 103: Computer Exercise – Anatomy & Physiology Revealed (APR)

**Muscles**

A. See your Lab Instructor to sign logbook for use of laptop and CD in the lab room.

B. Insert Anatomy & Physiology Revealed (APR) cd into cd drive and allow it to autoplay.

C. To enlarge image: right click on desk top → Properties → Settings → Screen Resolution → click and drag screen setting to 1024x768 pixels.

**Muscles**

1. Select system → **Muscular**. Select Dissection (scalpel icon) → Select Topic (Head and Neck) → Select view (Lateral) → Hit Green Go button → Select structure (Muscle) → Muscles of Chewing and Swallowing → Select **Temporalis** (layer 3) → Then click on animation icon.

2. Select **Change topic/view** → check out the remaining muscles on your lab handout. View the animations for each muscle.

   - Head & neck → Facial expression
     - Anterior view → Go
     - Orbicularis oris (layer 2)
     - Sternocleidomastoid (layer 3)
   - Lateral view → Go
     - Temporalis
     - Extrinsic eye muscle (lateral rectus)

Answer the following questions:

1) Which of the above muscles is a muscle of mastication? ______________

2) Name the muscle that abducts the eyeball? ______________

3) Which muscles originate on the sternum and clavicle? ______________

4) Which muscle is used in kissing? ______________

5) Name the muscle used to lower the head: ______________
• Back → Posterior view → Go
  o Trapezius
  o Triceps brachii
  o Gluteus maximus

• Abdomen → Anterior view → Go
  o Rectus Abdominis

• Thorax → Anterior view → Go
  o Pectoralis major

• Muscles that act on the knee → Hip and thigh → Anterior → Go
  o Quadriceps femoris (rectus femoris)

Check out the animations for the actions of these muscles.

6) What is the action of the “six-pack”? ________________

7) Which muscle is used to walk up stairs? ________________

8) Which muscle is involved with plantar flexion? ________________

9) Which muscle is involved with extension of the forearm? ________________

10) Which muscle inserts on the elbow? ________________

11) Name the muscle that moves the scapula: ________________

Histology (microscope icon)

Check out the three muscle tissues:

Skeletal, Cardiac, and Smooth muscle

Don’t forget to eject the CD prior to closing down the laptop!
Lab 11: Eye and Ear

Unit 9: General & Special Senses (p. 223-245)

Locate the following structures on models, charts, and *sheep eye:

The EYE

**Extrinsic Muscles**

**Conjunctiva**

Lacrimal Gland

Nasolacrimal duct

Fibrous tunic:  

- *Cornea
- *Sclera

Vascular tunic:  

- *Iris
- *Pupil
- *Ciliary body
- *Choroid

Sensory (Neural) tunic:  

- *Retina
  - Rods
  - Cones
  - Macula lutea
  - Fovea centralis
  - Optic nerve (CN II)
- *Lens
- *Optic disk
- *Aqueous humor
- *Vitreous humor

Visual Tests:

- Blind Spot:
- Near-Point Accommodation:
- Visual Acuity (Snellen Chart):
- Color Blindness (Ishihara color plates):
THE EAR

Exercise 9-2: Anatomy of Ear, Hearing, & Equilibrium, p. 234

Locate the following structures on models and charts:

External Ear
  Auricle (Pinna)
  External acoustic canal

Middle Ear
  Tympanic membrane
  Ossicles (Malleus, Incus, Stapes)
  Oval window
  Auditory (Eustachian) tube

Inner Ear
  Semicircular canals
  Vestibule
  Cochlea
    Organ of Corti (Spiral organ)
    Vestibulocochlear (Auditory) Nerve (CN VIII)

Hearing & Equilibrium Tests:
  Weber Test:

  Rinne Test:

  Romberg Test:
Bio 103: Computer Exercise – Anatomy & Physiology Revealed (APR)

Special Senses

The Ear

1. Select system → Nervous. Select Dissection (scalpel icon).
   Select Topic → Hearing/Balance. Select view → Lateral → Hit Green Go button.
   Select structure type → Sense Organs. Select structures from the structure list as they correspond to the lab handout. View the animations as you proceed through the structure list.

Structure list: Sense organs
   • Auricle
   • Cochlea
   • Semicircular ducts (or canals)
   • Tympanic membrane

Answer the following questions:
   1) What is the function of the structure known as the auricle or pinna?
      ________________________________
   2) Which organ helps to maintain balance and equilibrium? _________
   3) Which of the ossicles is attached directly to the “eardrum”? _______
   4) Which structure contains the spiral organ of Corti? ___________

Structure list: Nerves → Vestibulocochlear nerve

   5) Which cranial foramina does this nerve pass through? ____________
   6) This nerve is cranial nerve CN _________.
      (Remember to use Roman numerals!)

The Eye

2. Change topic/view → Select Topic → Vision. Select view → Eye-lateral → Hit Green Go button. Select structure type → Special Senses. Select structures from the structure list as they correspond to the lab handout. View the animations as you proceed through the structure list.
Structure list: **Sense Organs**
- Anterior chamber
- Choroid
- Ciliary body
- Cornea
- Iris
- Lens
- Pupil
- Sclera

Answer the following questions:
1) Where is the anterior chamber located and what does it contain?

2) The image is perceived in which lobe of the brain?

3) Which layer of the eyeball helps to prevent scattering of light rays?

4) Which structure protects the anterior part of the eye?

5) Which structure regulates the thickness of the lens?

6) Muscles within the ___________ regulate the size of the pupil.

Structure list: **Nerves**
- Optic disk
- Optic nerve
- Retina

7) The optic nerve is CN ________.

8) The crossing of the optic nerves in the brain is called _____________.

9) Where is the “blind spot” located?

10) The photoreceptors are located in the ________________.

Don’t forget to eject the CD prior to closing down the laptop!
LAB 12: Nerve Tissue, Nerves, Spinal Cord, and Brain

Unit 8: Nervous System (p. 181-221)

Ex. 8-1: Nervous Tissue, p. 191
Ex. 8-2: Anatomy of the Brain, p. 195
Ex. 8-3: Spinal Cord, p. 203

Giant Multipolar Neuron slide:
- cell body or soma
- processes

Motor Neuron model:
- cell body or soma
- dendrites
- axon
- Schwann cell
- nodes of Ranvier

Spinal Cord slide:
- gray matter
- white matter
- central canal

Spinal Cord model:
- gray matter
- white matter
- central canal
- dorsal (posterior) root ganglion
- ventral (anterior) root

Brain (human brain model and sheep brain)
- meninges (dura mater, arachnoid, pia mater)
- cerebrum
  - hemispheres (right & left)
  - longitudinal fissure
  - lobes (frontal, parietal, temporal, occipital)
  - sulci (valleys)
  - gyri (hills)
- olfactory bulbs and tracts
- optic chiasma
- cerebellum
  - arbor vitae
- pons
- medulla oblongata
- corpora quadrigemina
  - superior colliculi
  - inferior colliculi
- corpus callosum
- pineal gland
- thalamus
- hypothalamus
- infundibulum
- pituitary gland
**LAB 13: Cranial Nerves**

**Unit 8: Nervous System**

<table>
<thead>
<tr>
<th>Name</th>
<th>Test for Nerve Function</th>
<th>Major Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. OLFATORY</td>
<td>S only: Smell</td>
<td></td>
</tr>
<tr>
<td>II. OPTIC</td>
<td>S only: Vision</td>
<td></td>
</tr>
</tbody>
</table>
| III. OCULOMOTOR             | S: Receptors that influence pupil size  
M: Muscles that move eye  
(except sup. oblique, lat. rectus) |                                                     |
| IV. TROCHLEAR               | S: Muscle sense (eye muscles)  
M: Superior oblique eye muscle |                                                     |
| V. TRIGEMINAL               | S: Sensations of head, face  
M: Muscles of mastication |                                                     |
| VI. ABDUCENS                | S: Muscle sense (eye muscles)  
M: Lateral rectus eye muscle |                                                     |
| VII. FACIAL                 | S: Tastebuds (ant. 2/3 tongue)  
M: Muscles for facial expressions |                                                     |
| VIII. VESTIBULOCOCHLEAR     | S only: Hearing & equilibrium |                                                     |
| (or AUDITORY)               |                         |                                                     |
| IX. GLOSSOPHARYNGEAL        | S: Tastebuds (post. 1/3 tongue)  
Detects BP in the carotid a.  
M: Salivary glands & muscles for swallowing |                                                     |
| X. VAGUS                    | S: Pharynx, thoracic & abdominal viscera  
M: Major PSN nerve to thoracic & abdominal viscera |                                                     |
| XI. ACCESSORY (SPINAL)      | S: Proprioception from head, neck, shoulder muscles  
M: Head & shoulder movements |                                                     |
| XII. HYPOGLOSSAL            | S: Proprioception from tongue  
M: Tongue movement & swallowing |                                                     |

**Ex. 8-4: Cranial Nerves (p. 206-219)**

S = Sensory  
M = Motor