

LEARNING OBJECTIVES

1. Describe the structure of skeletal muscle from the microscopic to gross anatomy.
2. Describe the role of neuromuscular junctions and their structure.
3. Identify the three types of muscle through diagrams, models or microscope slides.
4. Understand the criteria in naming skeletal muscles

KEY WORDS

myofibrils	myofilaments	actin	myosin
sarcomeres	I band	Z line	A band
endomysium	perimysium	fascicle	epimysium
deep fascia	tendons	aponeuroses	
synaptic cleft	neurotransmitter	neuromuscular junction	
agonist	antagonist	synergists	fixators

EXPERIMENTS

Do the section on Organization of Skeletal Muscle Cells into Muscles, The Neuromuscular Junction, and Classification of Skeletal Muscles.

Compare and contrast the three types of muscle: smooth, cardiac and skeletal through diagrams, charts and microscope slides.

Hints: Draw each type of muscle, observe as many examples as possible (look at slides of others around you). Use shape and tissue structure as clues to identification, not the color of the stains.

LEARNING OBJECTIVES

1. Learn the names and origins & insertions of the head and neck muscles.
2. Learn the names and origins & insertions of the trunk, shoulder, and abdominal muscles.
3. Learn the names and origins & insertions of the arm muscles.
4. Learn the names and origins & insertions of the leg muscles.
5. Develop an understanding of opposing muscle groups and the necessity to balance the fitness of muscles around a joint.
6. Identify on a model or diagram each of the muscles listed below.

KEY WORDSMuscles of the Head and Neck:

occipitofrontalis (epicranium)

orbicularis oculi

orbicularis oris

zygomaticus major

buccinator

temporalis

masseter

sternocleidomastoid

Thorax and Ribs

diaphragm

external intercostals

internal intercostals

Abdominal Region

rectus abdominis

external oblique

internal oblique

transverse abdominis

Lab #15 Skeletal Muscle continued

Back, Shoulder and Chest

trapezius
levator scapulae
rhomboid major/minor
serratus anterior
pectoralis major/minor
deltoid
latissimus dorsi
supraspinatus
infraspinatus
teres major
teres minor

Hip and Thigh

iliopsoas: iliacus & psoas
gluteus med., max., min
piriformis
tensor fascia lata
gracilis
quadriceps femoris:
rectus femoris vastus intermedius
vastus medius vastus lateralis
sartorius
hamstrings:
semimembranosus
semitendinosus
biceps femoris

Upper Arm

biceps brachii
brachialis
triceps brachii
brachioradialis

Lower Leg

tibialis anterior
gastrocnemius
soleus
fibularis (peroneus) longus
extensor digitorum

Forearm

flexor carpi radialis
flexor carpi ulnaris
extensor carpi radialis: longus and brevis
extensor carpi ulnaris
extensor digitorum
palmaris longus
pronator teres

Pelvis

pelvic diaphragm:
levator ani
coccygeus

EXPERIMENTS

Do all of exercise 15: using the models and diagrams, identify the muscles listed above.

Use a skeleton and tape or string to place the muscles in the proper locations.

Locate the muscles on your own body and identify them.

Study questions:

1. Are marathon runners born or achieved/made during life? Are sprinters born or achieved/made during life? Explain your answer with scientific information concerning muscles, their function and the effects of training.
2. Are muscles the only factor in determining athletic greatness? Can we do a muscle biopsy at an early age and determine those who are destined to be great athletes? What other factors may or may not be involved.
3. Which types of muscles are able to produce more force and why: parallel or pinnate muscles?
4. Can a muscle that is the same cross sectional area generate more force if the length is increased? What if length remains the same and the cross sectional area increases? What accounts for these occurrences, if they do in fact occur?

(1) For the **HEAD and NECK** : develop an acronym for the names of the muscles.

(2) For the **TRUNK, SHOULDER AND ABDOMEN** : develop an acronym OR SOME OTHER WAY TO REMEMBER THEM for the names of the muscles.

(3) For the **ARM** : develop an acronym OR SILLY POEM for the names of the muscles.

(4) For the **LEG** : develop an acronym OR LEWD COUPLET for the names of the muscles.

Lab 16B Skeletal Muscle Physiology: Computer Simulation

LEARNING OBJECTIVES

1. Define the terms maximal stimulus, treppe, wave summation, multiple motor unit summation, and tetanus
2. Describe the different manner stimulation can alter muscle force of contraction.
3. Explain how smooth slow sustained contractions are possible in skeletal muscles.
4. Graphically understand relationships between passive, active and total forces.
5. Describe isometric and isotonic, including length and force transitions.
6. Explain experimental results in terms of muscle structure.

KEY WORDS

multiple stimulus
tetanus

treppe
isotonic contraction

wave summation
isometric contraction

Study questions:

1. Why is treppe important in understanding muscle function?
2. Is tetanus a disease?
3. Look at questions from Isometric contractions.