Myology (Muscle Tissue)

1. Introduction

   A. Myology
      Homeostatic Characteristics
      i. Excitability
      ii. Contractility
      iii. Extensibility
      iv. Elasticity

   B. Functions

      i. Motion

      ii. Posture Maintenance

      iii. Heat Production

2. Muscle Types

   A. Skeletal Muscle Tissue

      i. Striated

      ii. Voluntary

   B. Cardiac Muscle Tissue

      i. Striated

      ii. Involuntary

   C. Smooth Muscle Tissue

      i. Nonstriated

      ii. Involuntary

3. Skeletal Muscle Tissue (See illustration in text)

A. Components

i. Fascia.

a. Superficial Fascia

b. Deep Fascia

- Epimysium
- Perimysium
  - * Fasciculi (Fascicles)
- Endomysium

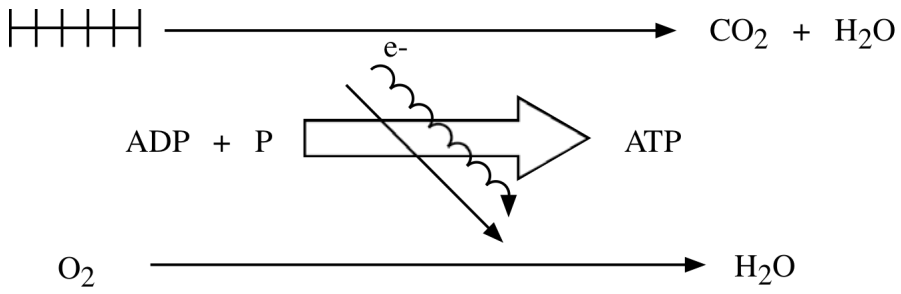
ii. Tendon

iii. Aponeurosis

iv. Tendon (Synovial) Sheaths

4. Nerve and Blood Supply

A. Blood Supply



B. Motor Unit (SEE HANDOUT)

i. Large Motor Units vs. Small Motor Units.

5. Cytological / Histological Considerations

A. Myofibers

i. Myoblasts

B. Sarcolemma

C. Sarcoplasm

D. Myofibrils

- Fibril

E. Myofilaments

i. Thin Myofilaments

ii. Thick Myofilaments

F. Sarcomeres

i. Z Line (or disk)

G. Sarcoplasmic Reticulum

H. Terminal Cisterns

I. Transverse Tubules (T Tubules)

6. Skeletal Chemistry

A. Thin Myofilaments

i. Actin

a. Myosin-binding site

ii. Tropomyosin-troponin Complex

a. Tropomyosin

b. Troponin

iii. Configuational Changes and Calcium

B. Thick Myofilaments

i. Myosin

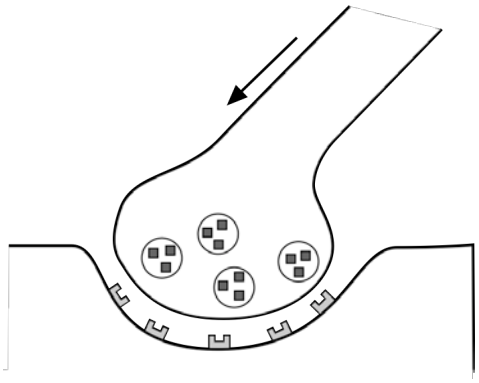
a. Cross Bridges

b. Actin-Binding Site

c. ATP-Binding Site

Note that there are many excellent animations on the web.

8. Neuromuscular Junction



A. Neuron

B. Motor Neuron

i. Motor End Plate

ii. Neuromuscular Junction

iii. Synaptic End Bulbs

a. Synaptic Vesicles

- Calcium Gates and "Cascade of Reactions" → Exocytosis

b. Neurotransmitters

iv. Synaptic Cleft

v. Acetylcholine (Ach)

- Acetylcholinesterase (Ache)

C. Motor Unit (Pull out your handout on this topic)

9. Energy for Contraction and Relaxation

(PULL OUT HANDOUT FROM WEB)

A. Phosphagen System (See handout)

- ATP → ADP + P + Energy
- Phosphocreatine

B. Glycogen-Lactic Acid System (See handout)

- Calmodulin

1 Glucose → 2 Pyruvic acid + ATP

Pyruvic acid + O_2 → CO_2 + H_2O + ATP

12. Muscle Tone

A. Muscle Spindles

B. Atrophy and Hypertrophy

i. Muscular Atrophy

a. Disuse Atrophy

b. Denervation Atrophy

C. Muscular Hypertrophy