



# LECTURE 26

5/28/20



# Missing work!!!

- ch 8 HW test, ch 9.1 worksheet, mini cell project, ch 10 HW which was 10.1 and 10.2 worksheets, ch 10 CW which was make 5 test questions for chapter 10 and answers, ch 10 HW test, 11.1 and 11.2 worksheets, 11.4 worksheet, Ch 12.1 worksheet, Ch 11 HW test, 14.1 CW, Ch 12.1, 12.2, 14.1 HW quiz, ch 16 CW, 5 test like questions and answers chapter 16, ch 16 HW test, ch 18 HW quiz, Ch 19 HW quiz
- You have until this week to turn it in

# Important Dates

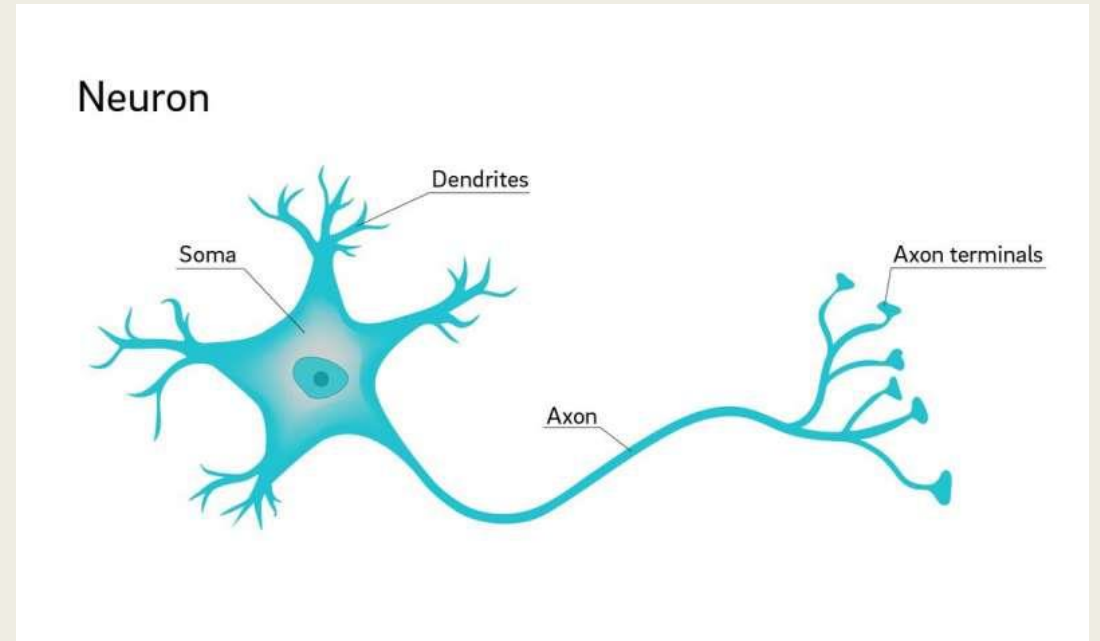
- You have until this week 5/25-5/29 to resubmit HW test/quiz if you received less than a C (if you had a D or F)
- Last day to submit missing work → 5/28
- After 5/28 you will get Z's for missed work
- Next Tuesday → 6/2 is our final session

# 30.3 and 30.4 recap

- Digestive and excretory recap

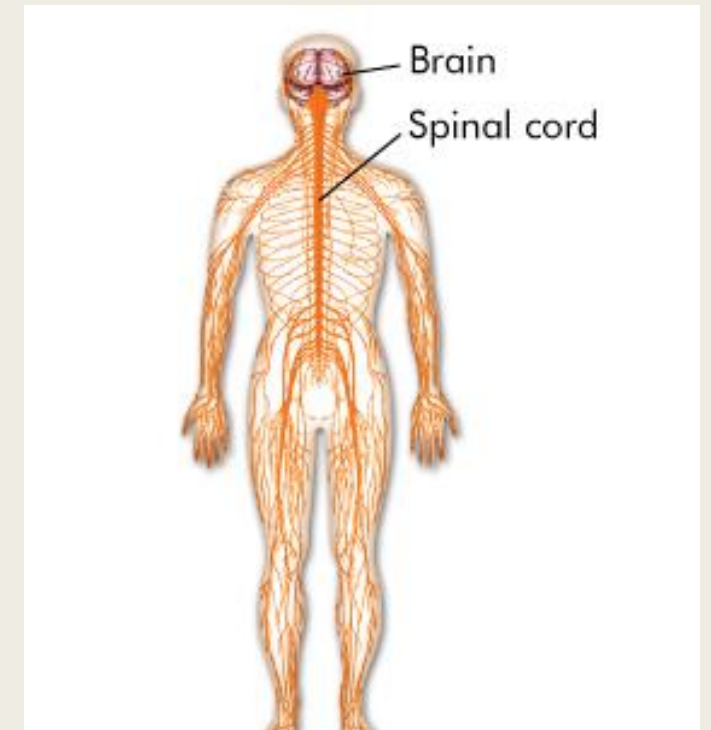
# 31.2 the central nervous system

- Types of neurons:
- Neurons can be classified into three types according to the direction in which an impulse travels.
- Sensory neurons carry impulses from the sense organs, such as the eyes and ears, to the spinal cord and brain.
- Motor neurons carry impulses from the brain and the spinal cord to muscles and glands.
- Interneurons process information from sensory neurons and then send commands to other interneurons or motor neurons.



# The brain and spinal cord

- Where does processing of information occur in the nervous system?
- Each of the major areas of the brain—the cerebrum, cerebellum, and brain stem—is responsible for processing and relaying information.
- The spinal cord is the main communication link between the brain and the rest of the body.
- This makes up the **CENTRAL NERVOUS SYSTEM**
- The control point of the central nervous system =brain.
- Information processing is the brain's principal task.
- The spinal cord→ communication link between the brain and the rest of the body.



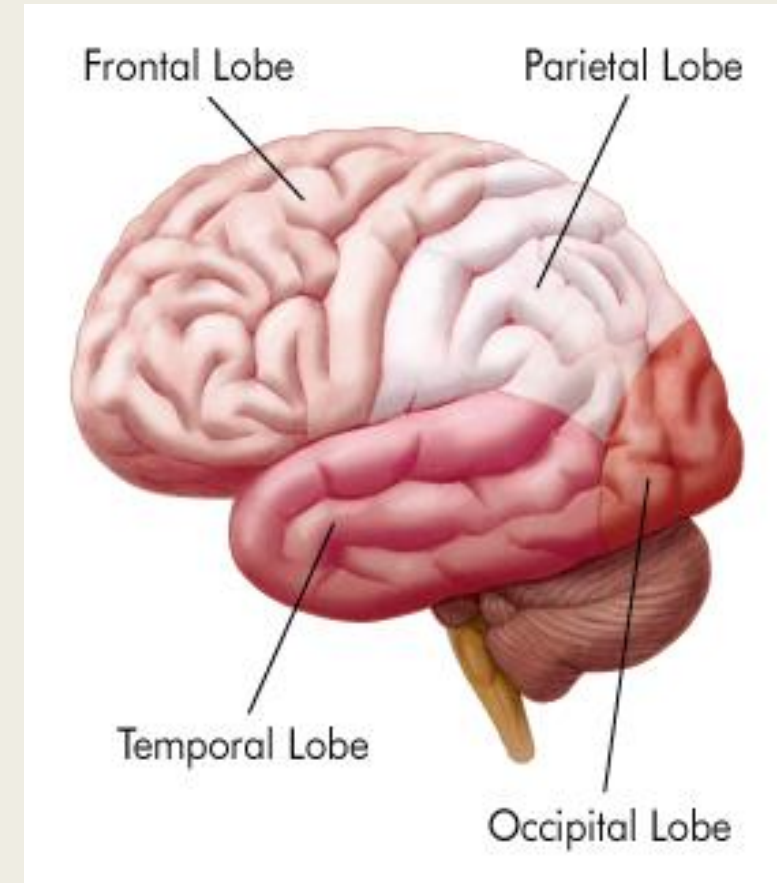
# Cerebrum

- The largest region of the human brain is the cerebrum.
- The **cerebrum** is responsible for the voluntary, or conscious, activities of the body.
- It is also the site of intelligence, learning, and judgment.



# Hemispheres

- **cerebrum divided into left and right hemispheres:**  
Each hemisphere is divided into four regions called lobes.
- frontal: consequences, making judgments, forming plans.
- Temporal: hearing, smell
- Occipital: vision
- Parietal: reading and speech





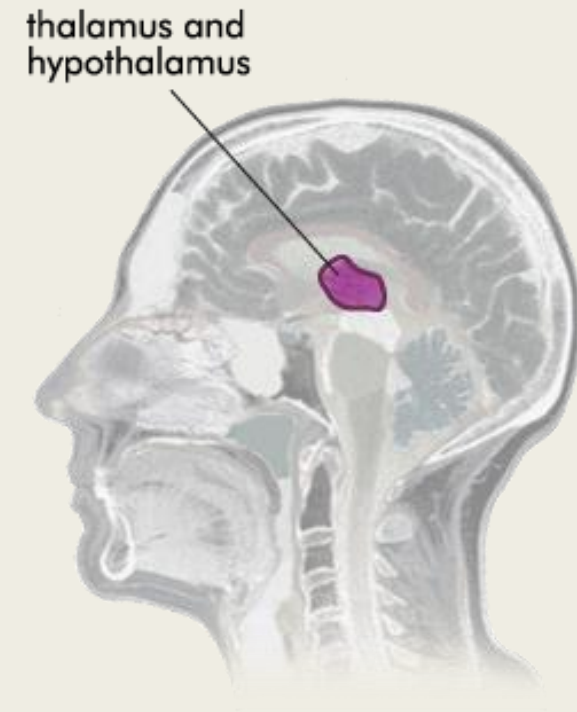
# Limbic system

- Deals with emotion, behavior, and memory



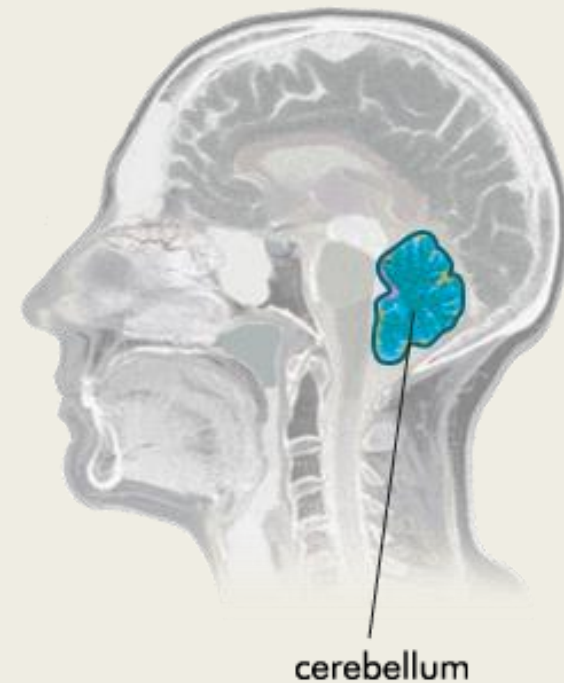
# Thalamus and hypothalamus

- Thalamus: receives messages from sensory receptors, sends information to the cerebrum
- Hypothalamus: recognizes hunger, thirst, fatigue, anger, body temperature, coordinates the nervous and endocrine system



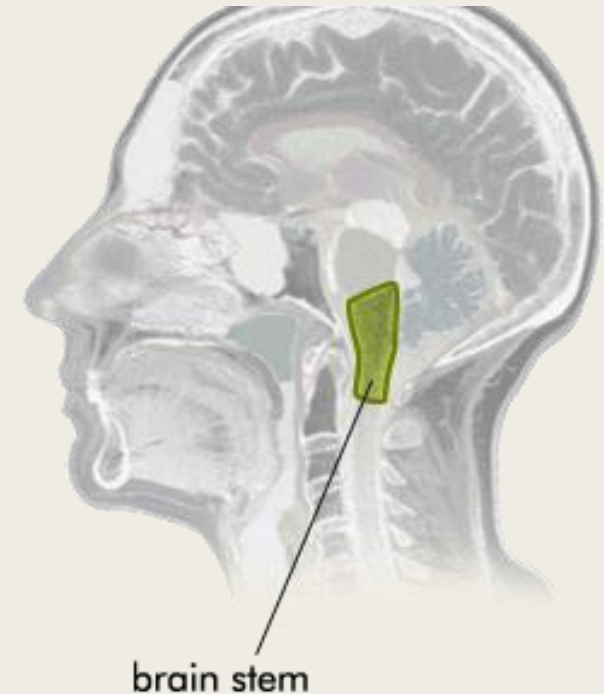
# Cerebellum

- The second largest region of the brain is the **cerebellum**.
- Information about muscle and joint position, as well as other sensory inputs, is sent to the cerebellum.



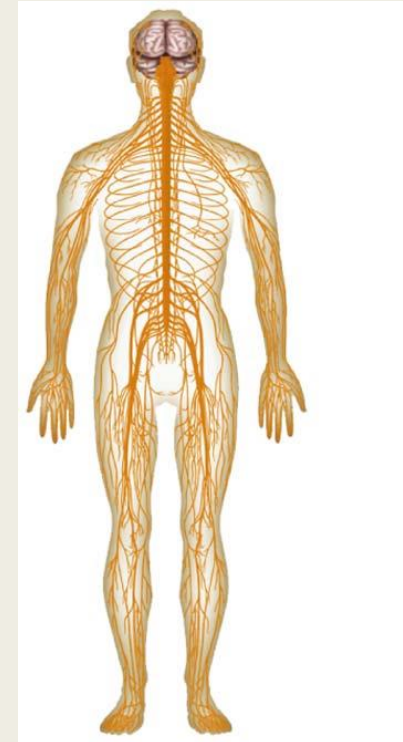
# Brain stem

- The **brain stem** connects the brain and spinal cord.
- The brain stem includes three regions.
- Each of these regions regulates the flow of information between the brain and the rest of the body.
- Functions such as regulation of blood pressure, heart rate, breathing, and swallowing are controlled by the brain stem.
- The brain stem keeps the body functioning even when you have lost consciousness due to sleep or injury.



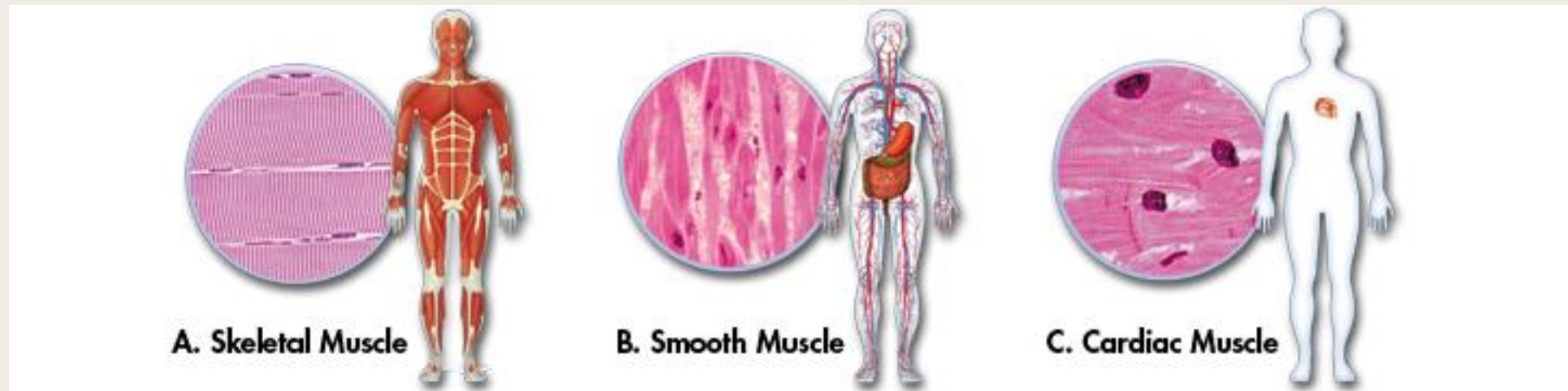
# Nervous system

- **Function:** Recognizes and coordinates changes in internal and external environments.
- Control center of the body.
- Response to the environment:
- All animals respond to their environment through specialized cells called nerve cells (neurons).
- Nervous systems can range from fairly simple to extremely complex.



## 32.2 the muscular system

- Muscle tissue:
- There are three different types of muscle tissue, each specialized for a specific function in the body: skeletal, smooth, and cardiac.

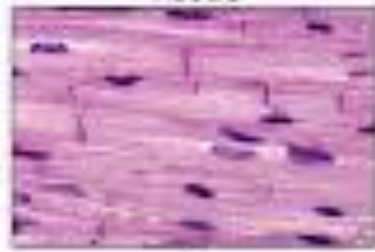


Smooth Muscle  
Tissue



Involuntary  
Control

Cardiac Muscle  
Tissue



Involuntary  
Control

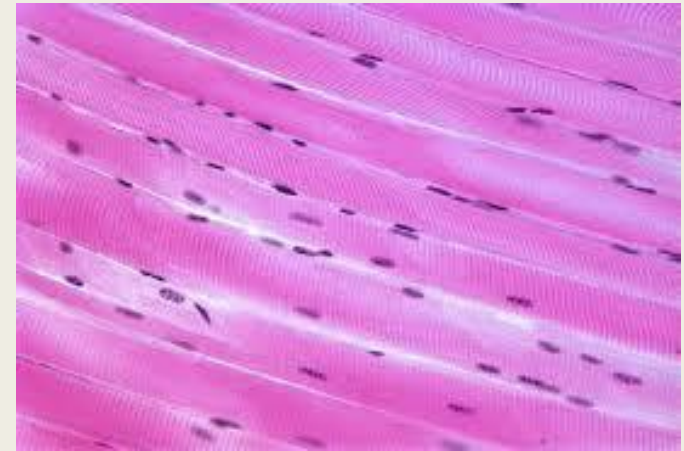
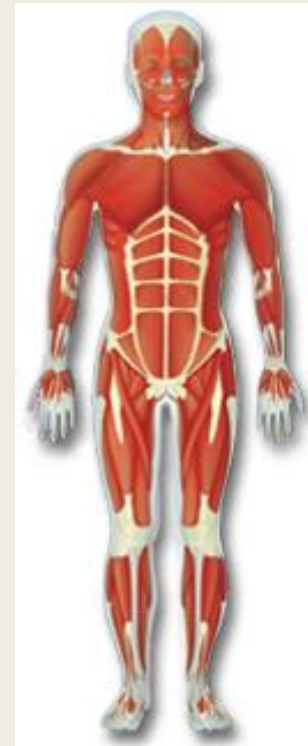
Skeletal Muscle  
Tissue



Voluntary  
Control

# Skeletal muscles

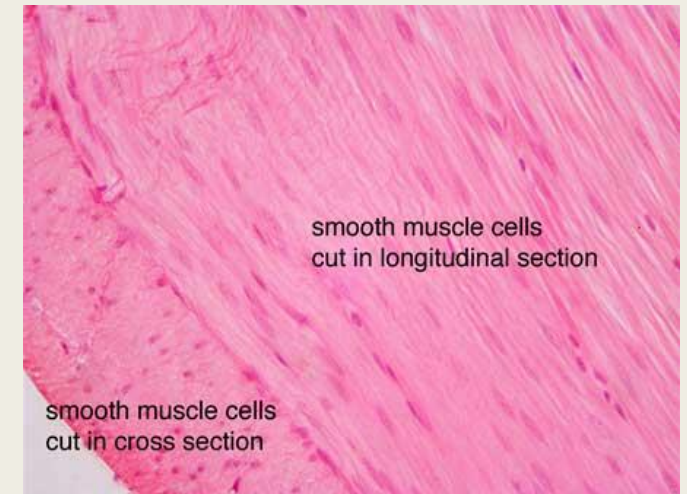
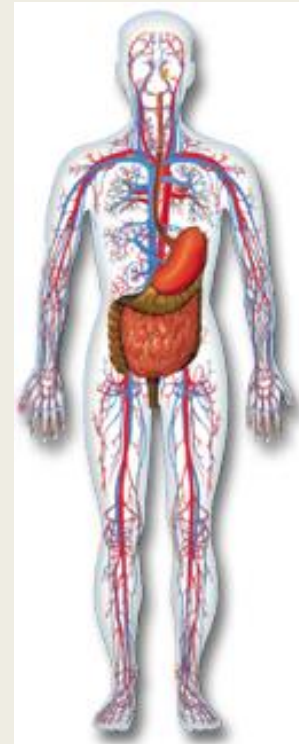
- Skeletal muscles are usually attached to bones.
- Most skeletal muscle movements are voluntary (you control them)
- Skeletal muscle cells are large, have many nuclei, vary in length, and are long and slender
- When viewed under a microscope, skeletal muscle appears to have alternating light and dark bands called “striations.” For this reason, it is said to be striated.





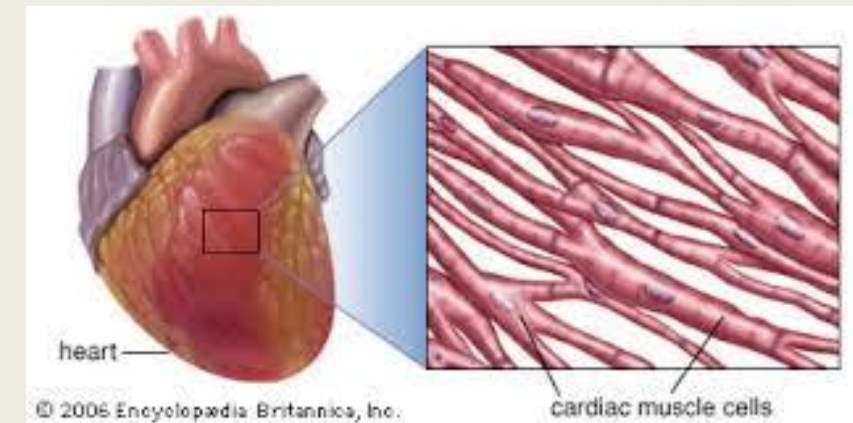
# Smooth muscles

- Smooth muscle cells don't have striations and therefore look “smooth” under the microscope.
- Smooth muscle cells are spindle-shaped and have one nucleus.
- Smooth muscles form part of the walls of hollow structures such as the stomach, blood vessels, and intestines.
- Smooth muscle movements are involuntary and perform functions such as moving food through the digestive tract, controlling the flow of blood through the circulatory system, and even decreasing pupil size in bright light.



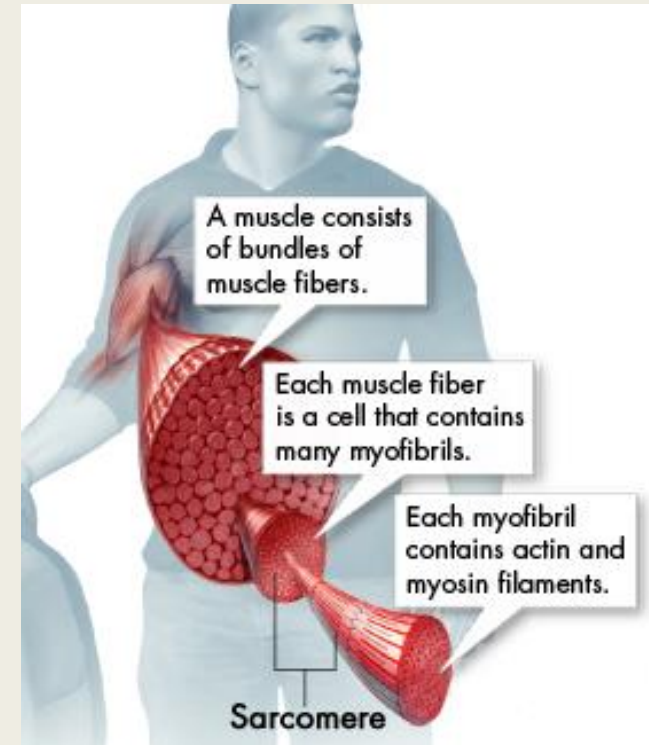
# Cardiac muscle

- Cardiac muscle is found in the heart.
- It is striated like skeletal muscle but has smaller cells and usually have just one or two nuclei.
- Involuntary muscle control and have their own “pace maker” cells that tell it when to contract



# Muscle fiber structure

- Skeletal muscle cells, or fibers, are filled with tightly-packed filament bundles called myofibrils.
- Each myofibril contains thick filaments of a protein called myosin and thin filaments of a protein called actin.

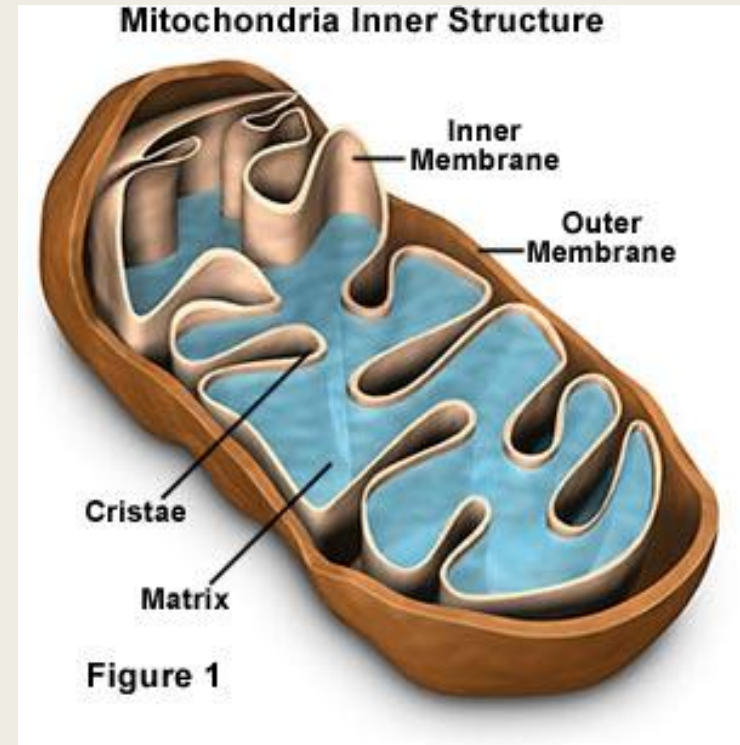


# Energy

Fibers contain multiple mitochondria for energy

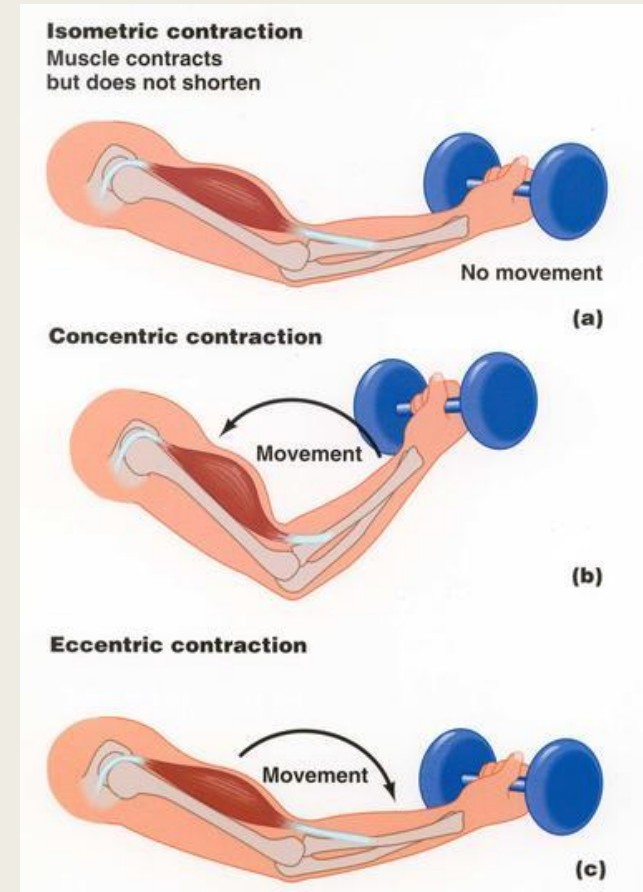
Mitochondria produce energy in the form of ATP through the process of cellular respiration.

Most fibers have multiple nuclei



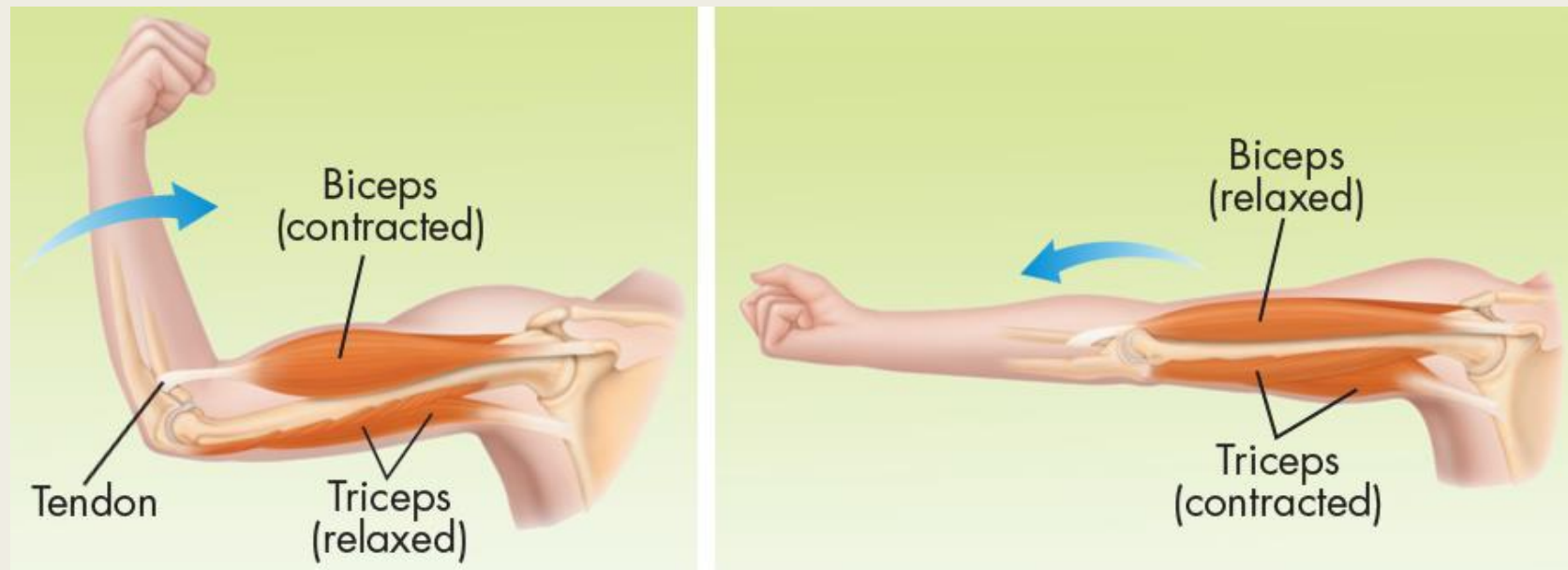
# Muscles and movement

- How do muscle contractions produce movement?
- Skeletal muscles generate force and produce movement by pulling on body parts as they contract. [muscles NEVER push, they only pull]



# How muscles and bones interact

- Skeletal muscles are joined to bones by tough connective tissues called **tendons**.
- Tendons pull on the bones to produce movement
- Most skeletal muscles work in opposing pairs—when one muscle contracts, the other relaxes.



# Review

- The central nervous system:
- [https://www.youtube.com/watch?v=q8NtmDrb\\_qo](https://www.youtube.com/watch?v=q8NtmDrb_qo)
- The muscular system:
- <https://www.youtube.com/watch?v=VVL-8zr2hk4>
- <https://www.youtube.com/watch?v=rMcg9YzNSEs>
- <https://www.youtube.com/watch?v=Ktv-CaOt6UQ>