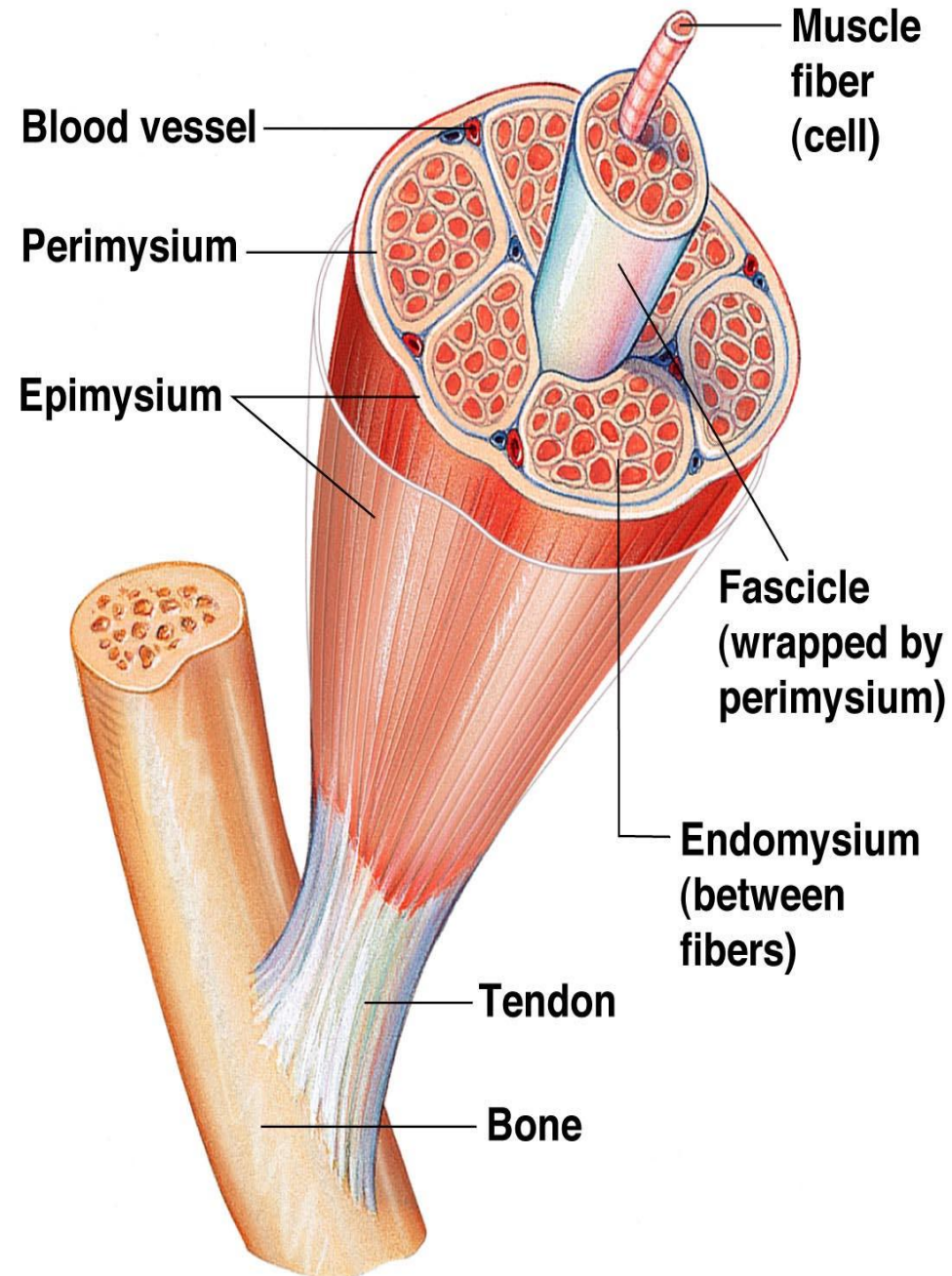


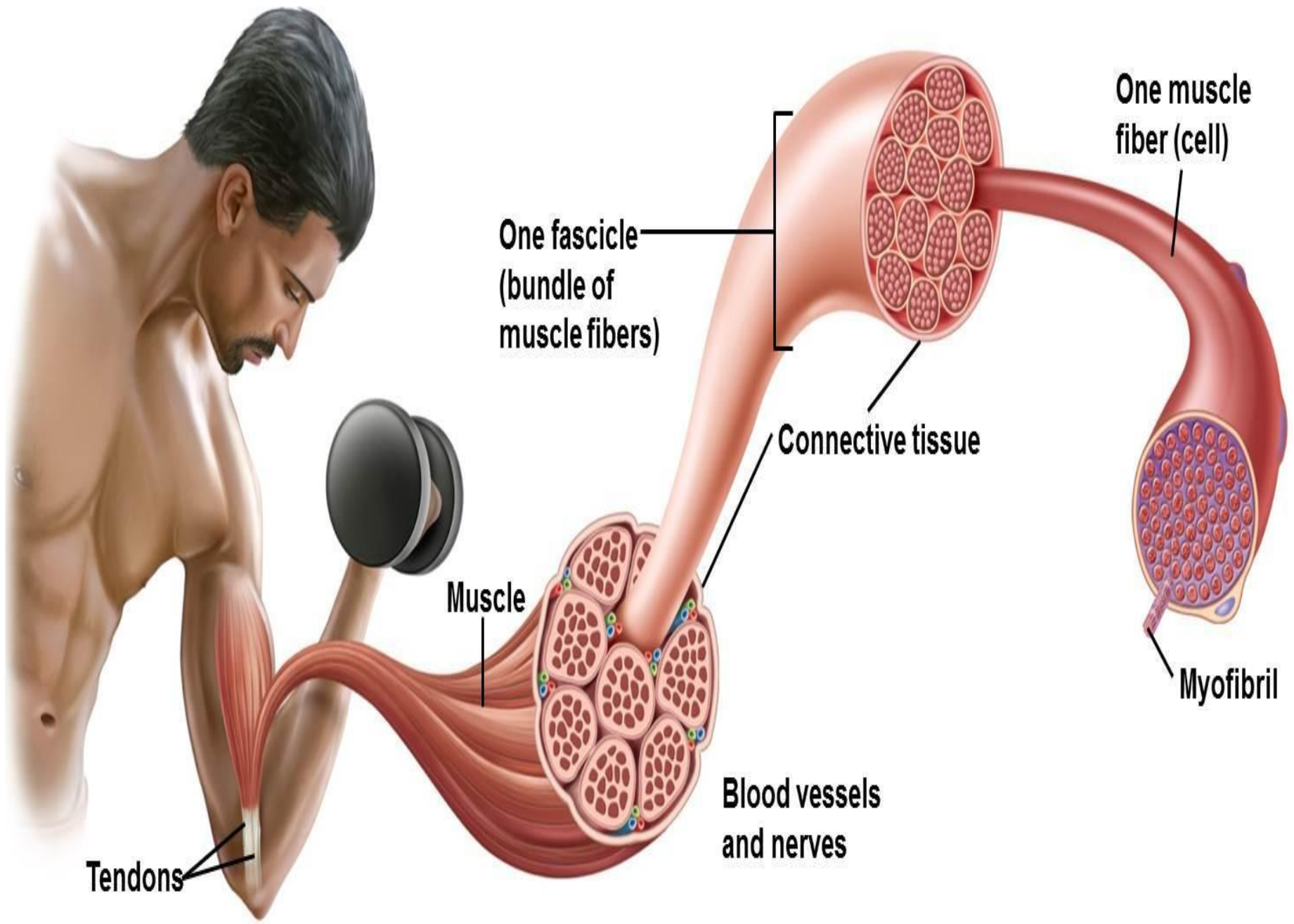


Human muscular system

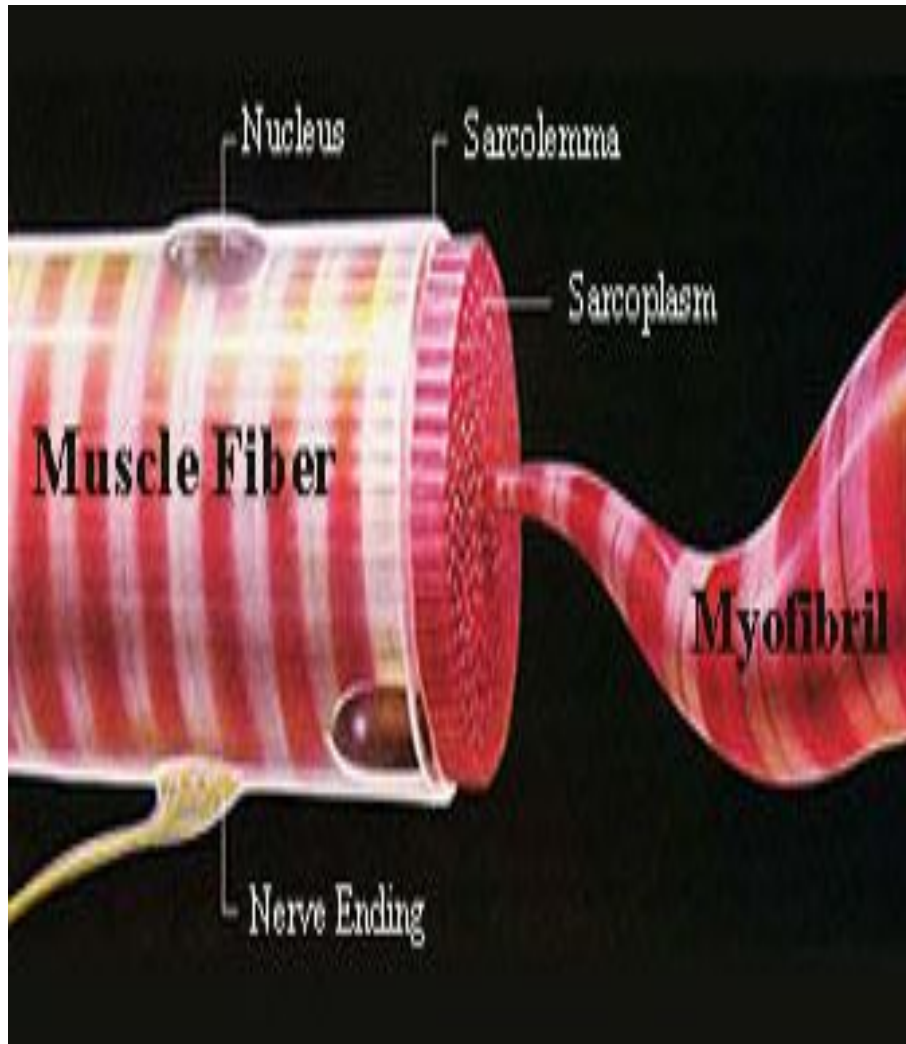
Muscular system

- Locomotion is provided by specialized muscle tissue
- It is composed of specialized cells, known as **myocytes** which have an ability to contract and relax

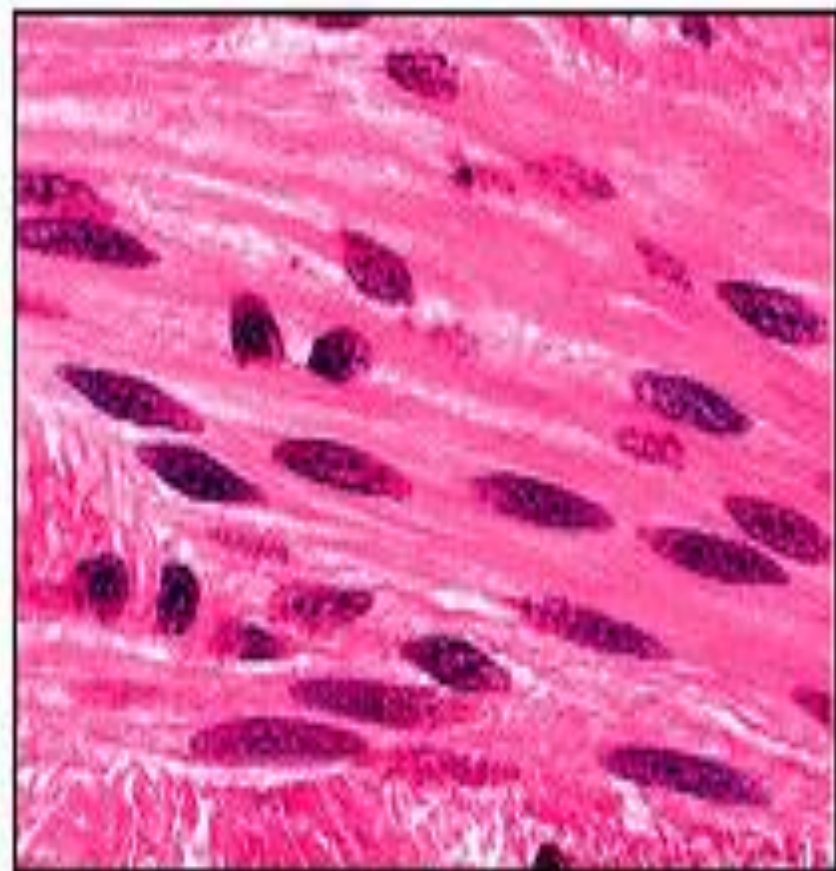




MUSCLE



- A muscle cell consists of
 - - **sarcolemma** (membrane) –
 - - **sarcoplasm** (cytoplasm)
 - It contains **myofibrils** (proteins)



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Masseter

Pectoralis major

Brachioradialis

Sartorius

Rectus femoris

Gastrocnemius

Deltoid

Biceps brachii

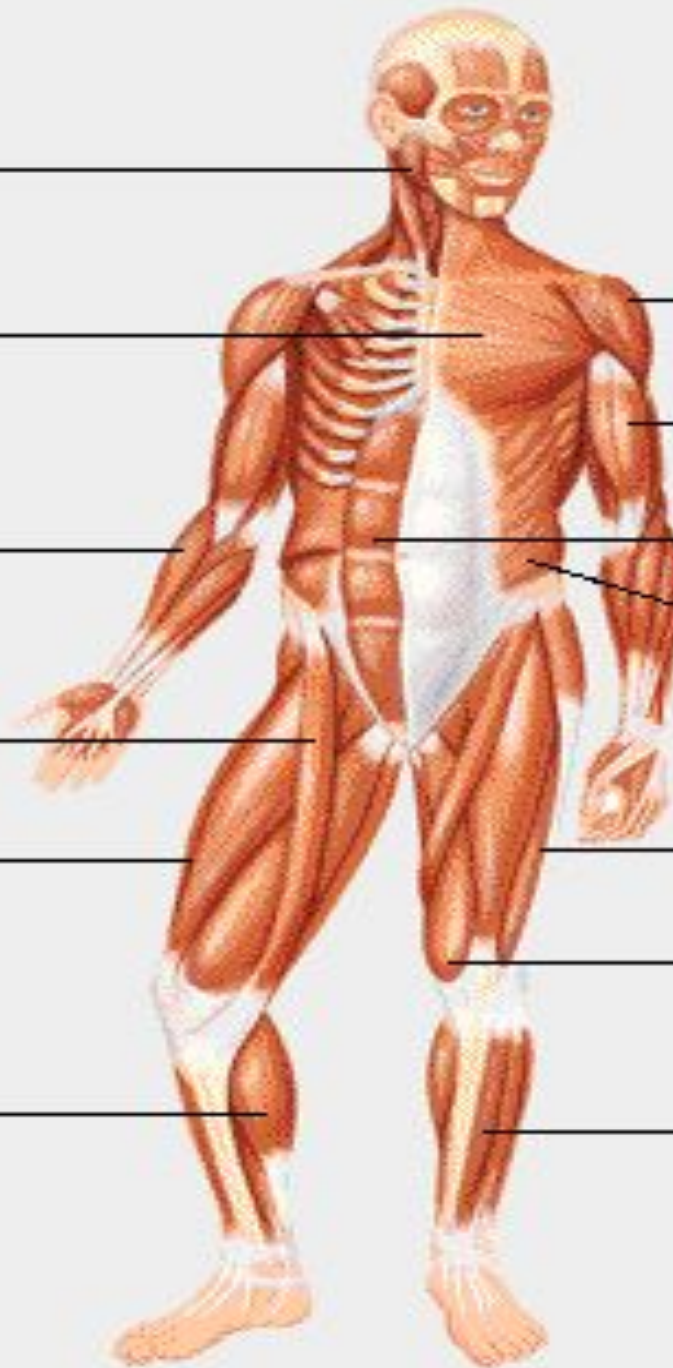
Rectus abdominis

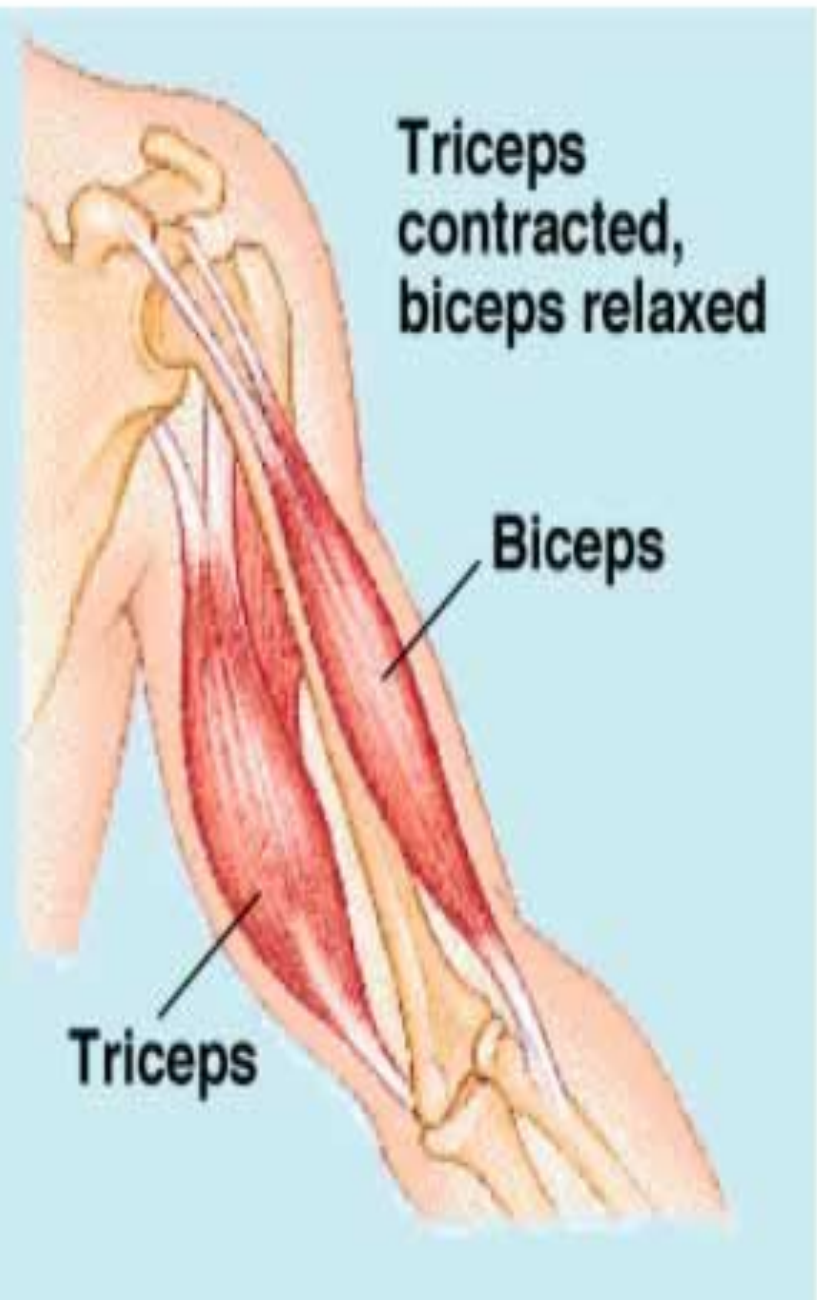
External oblique

Vastus lateralis

Vastus medialis

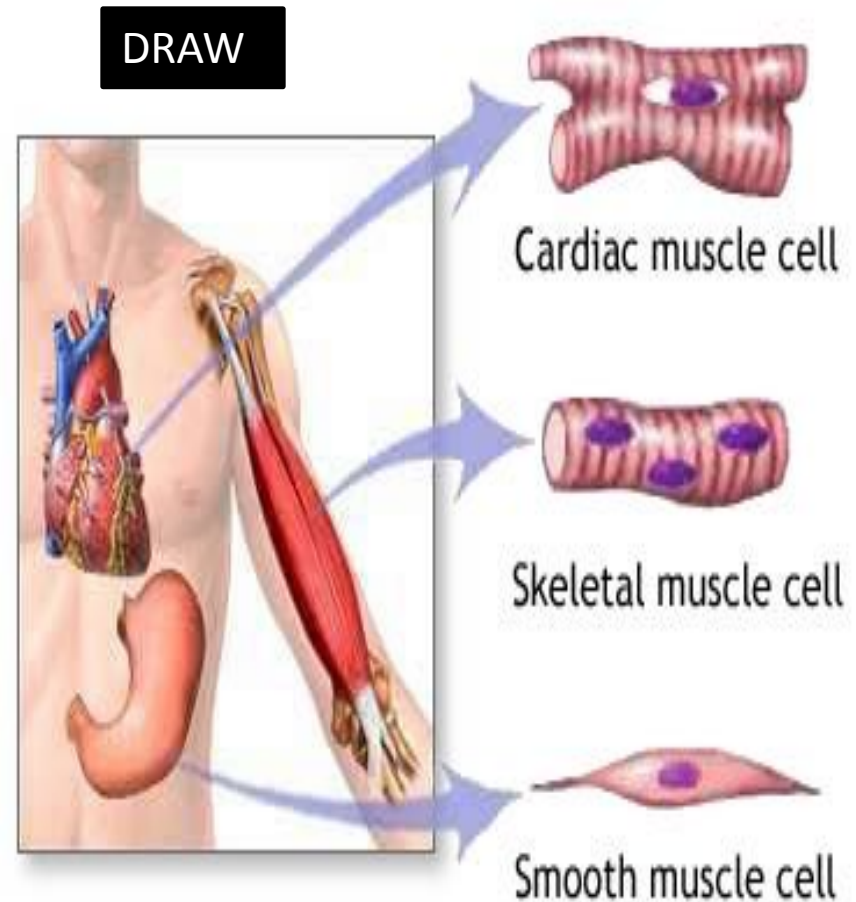
Tibialis anterior



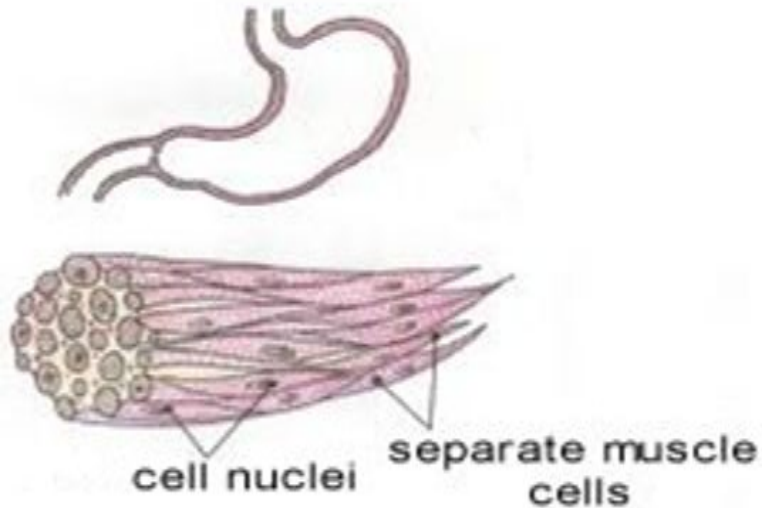


Types of muscles

- Muscle tissue is divided into three groups:
- smooth
- striated skeletal
- striated cardiac



Smooth muscle

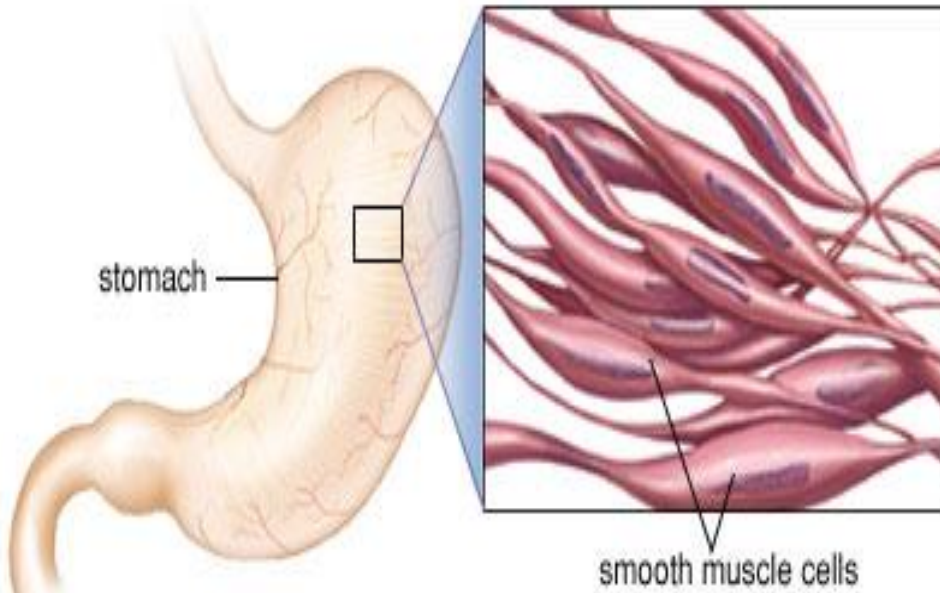


Smooth muscle



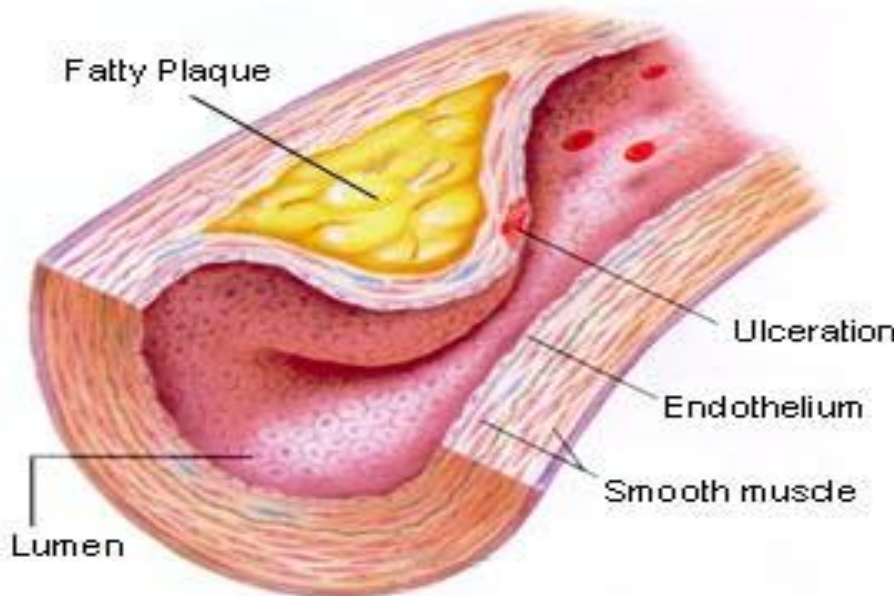
Smooth muscle cell

- Each cell is long, fibrous and sharp-ended with a single central nucleus
- They are regulated by the ***autonomic nervous system*** (ANS) since they are located in organs that function involuntarily
- Their function is generally irregular and slow



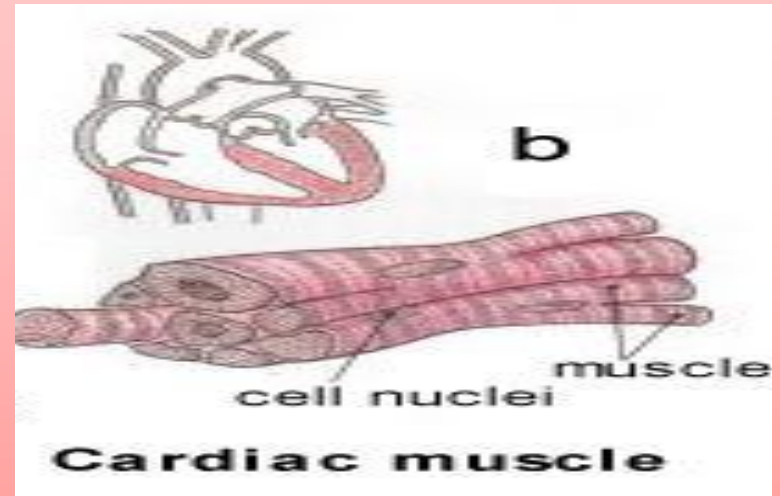
SMOOTH MUSCLE

- Smooth muscle cells participate in the structure of *internal organs* (digestive organs, walls of blood vessels) of humans



Cardiac muscle

- The nucleus is located at the center of each cell
- Each cell has branch-like projections
- Each cell is rich in blood and lymph vessels.



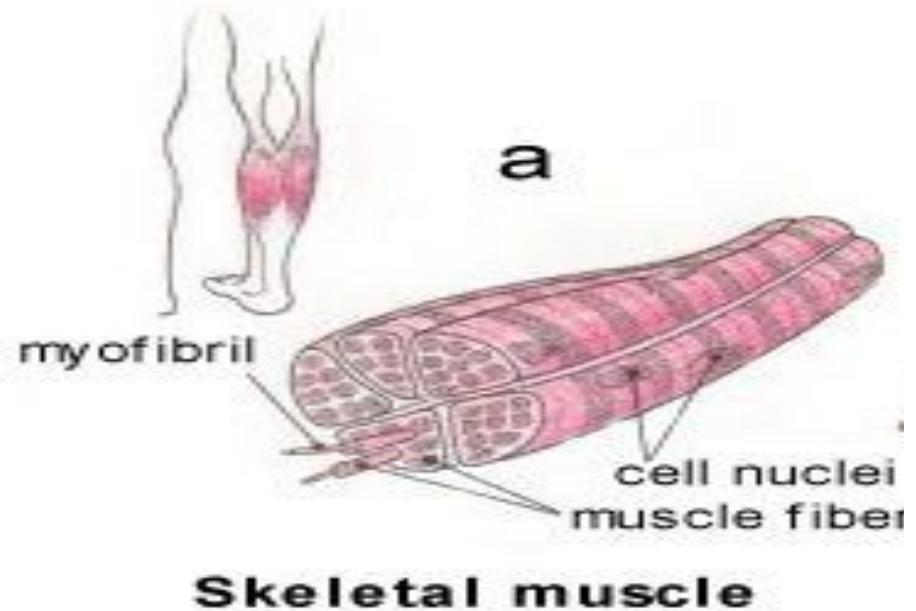
Cardiac muscle

- The cardiac muscles perform their functions ***involuntarily*** under the control of the autonomic nervous system



Skeletal muscle

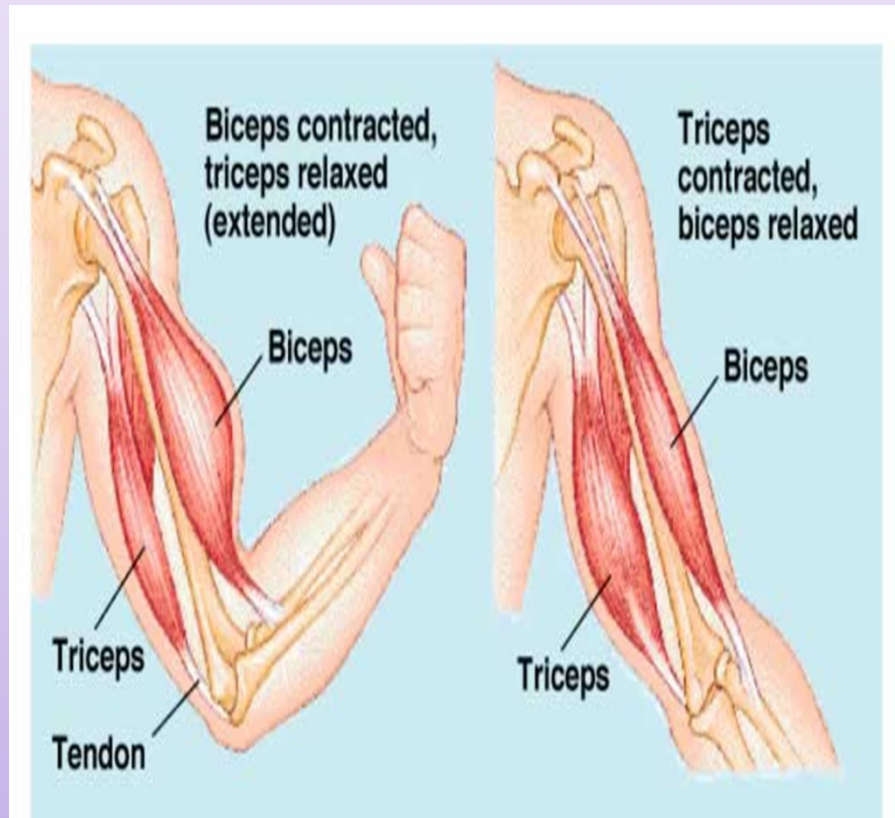
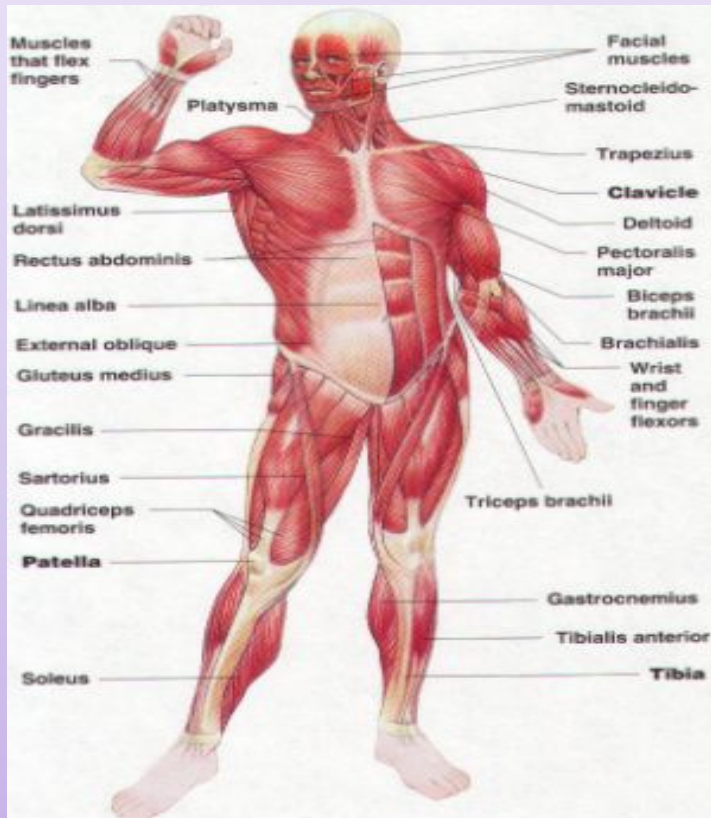
- They cover the skeleton
- They provide locomotion in cooperation with the skeletal system
- **Cells** of striated muscles are long, cylindrical and multinucleated



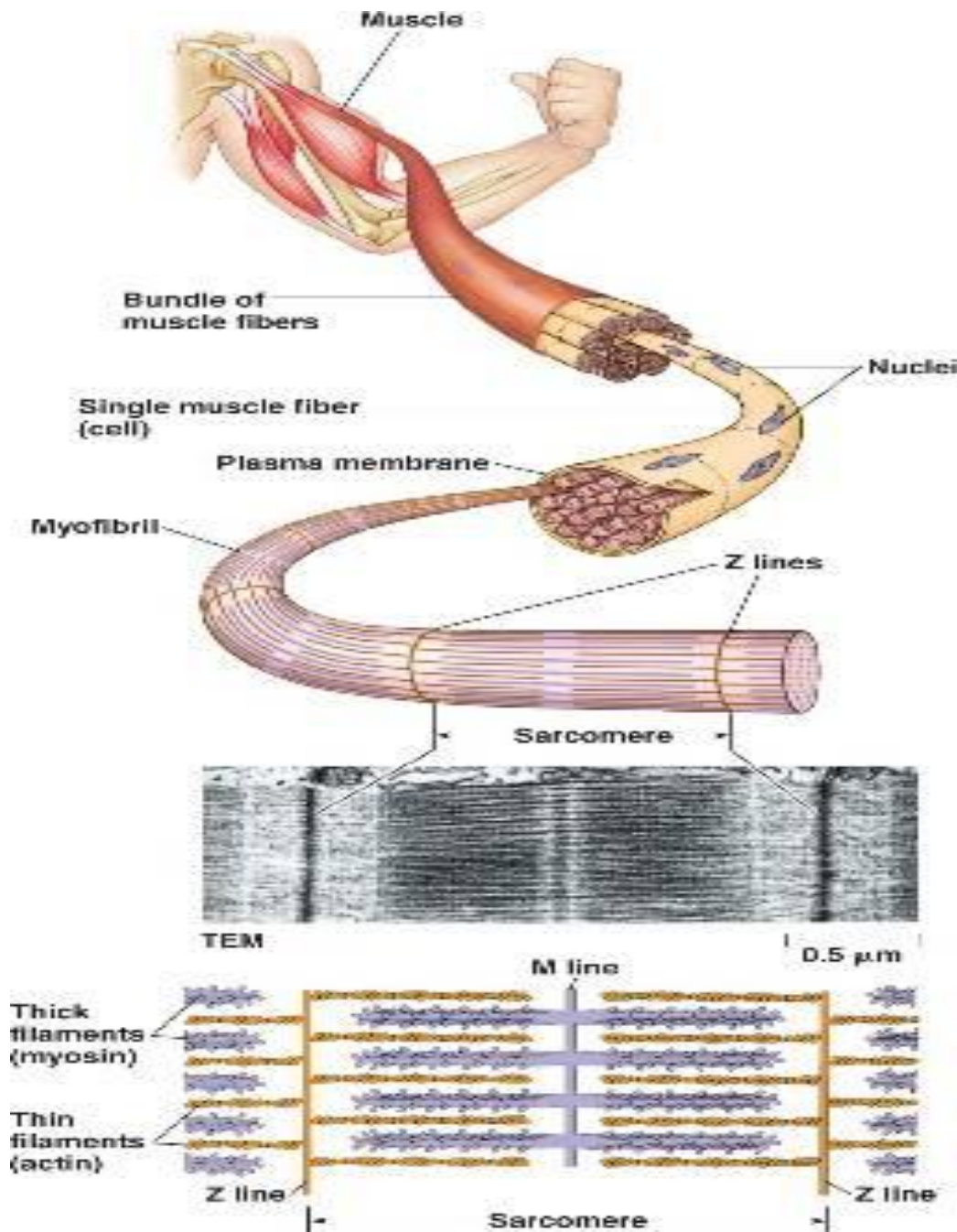
Skeletal muscle cell

Skeletal muscle

- They are termed *muscle fibers* due to their morphological appearance



Skeletal muscle



- The *myofibrils* composed of actin and myosin proteins
- They are arranged in parallel lines
- Striated skeletal muscle is voluntary and functions under the control of the brain
- It contracts rapidly

