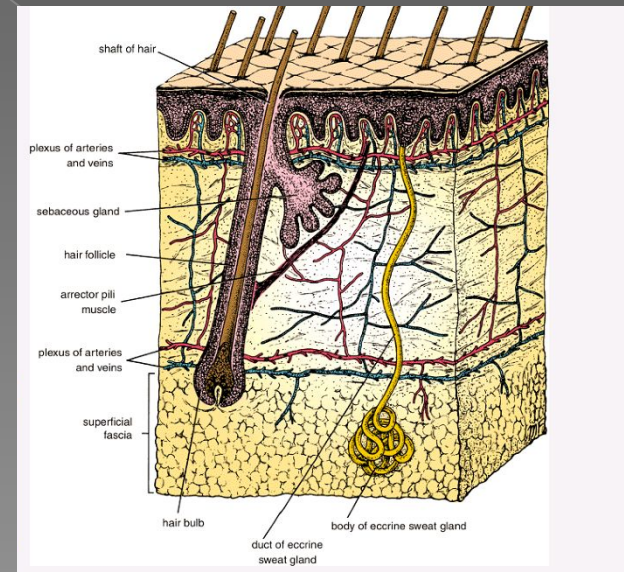




INTRODUCTION TO ANATOMY: skin, fascia, muscles and nerves

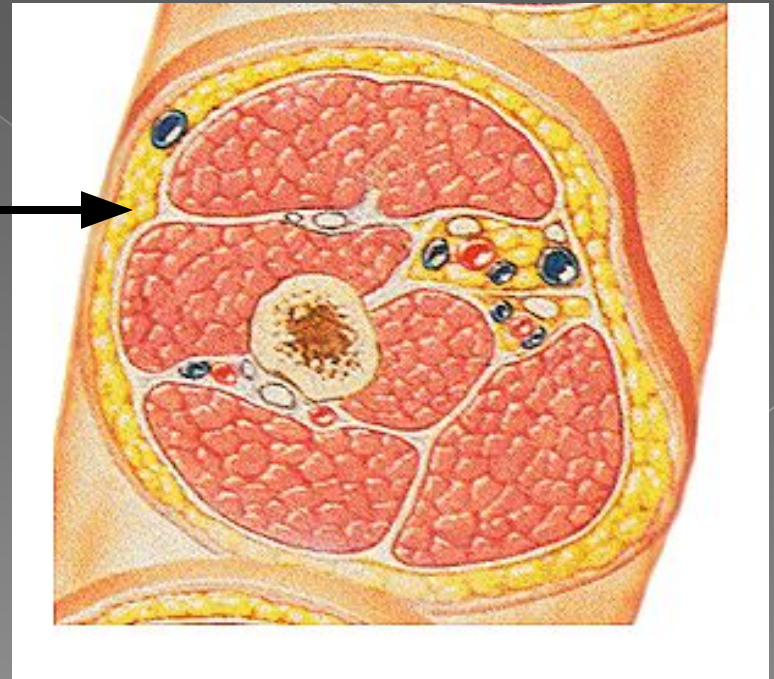
Dr. Asaad AL-SHOUK
M.D.PH.D.
Anatomy Department

- Skin consists of two components: epidermis and dermis. The surface epithelium of the skin is the epidermis and is of the keratinized stratified squamous variety. The various skin appendages—sweat glands, sebaceous glands, hair and nails—are specialized derivatives of this epidermis, which is ectodermal in origin. The deeper dermis is mesodermal in origin and consists mainly of bundles of collagen fibres together with some elastic tissue, blood vessels, lymphatics and nerve fibres



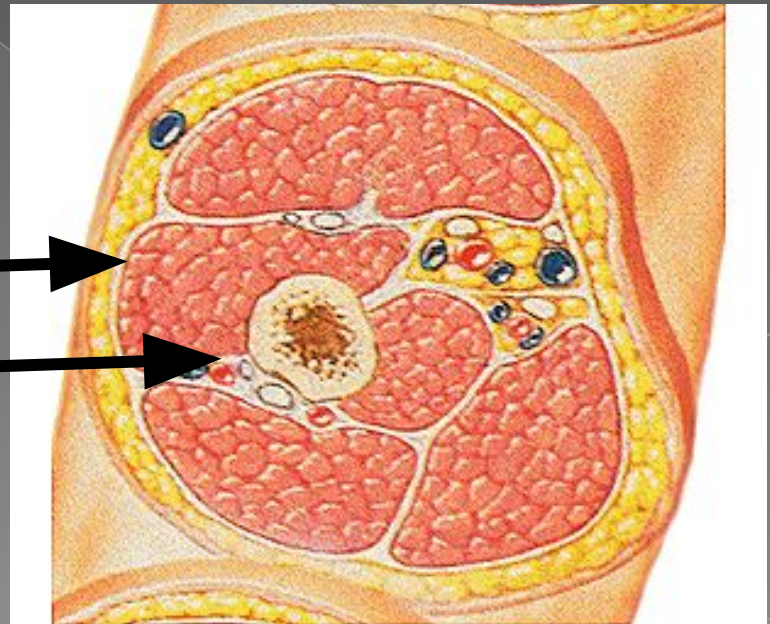
- SUPERFICIAL FASCIA

- The skin is connected to the underlying bones or deep fascia by a layer of loose areolar connective tissue. This layer, usually referred to as superficial fascia, is of variable thickness and fat content. The superficial fascia is most distinct on the lower abdominal wall where it differentiates into two layers. Strong connective tissue bands traverse the superficial fascia binding the skin to the underlying aponeurosis of the scalp, palm and sole.



- DEEP FASCIA

- The limbs and body wall are wrapped in a membrane of fibrous tissue, the deep fascia. It varies widely in thickness. Where deep fascia passes directly over bone it is always anchored firmly to the periosteum. Intermuscular septa are laminae of deep fascia which extend between muscle groups, frequently becoming continuous with the periosteum of bones. Deep fascia is very sensitive. Its nerve supply, and that of subcutaneous periosteum, is that of the overlying skin. The nerves to muscles supply the intermuscular septa and deep periosteum.



The Muscles

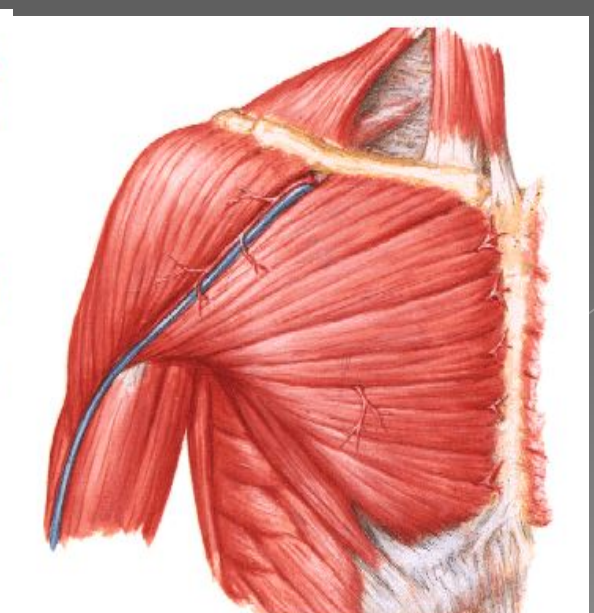
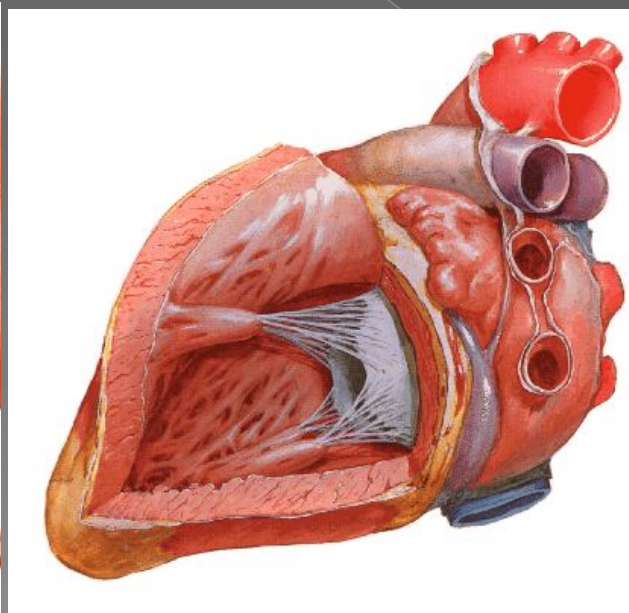
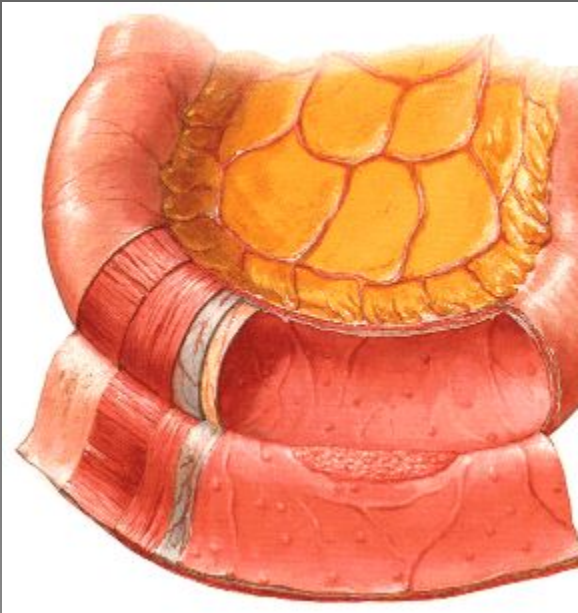


The Muscles:

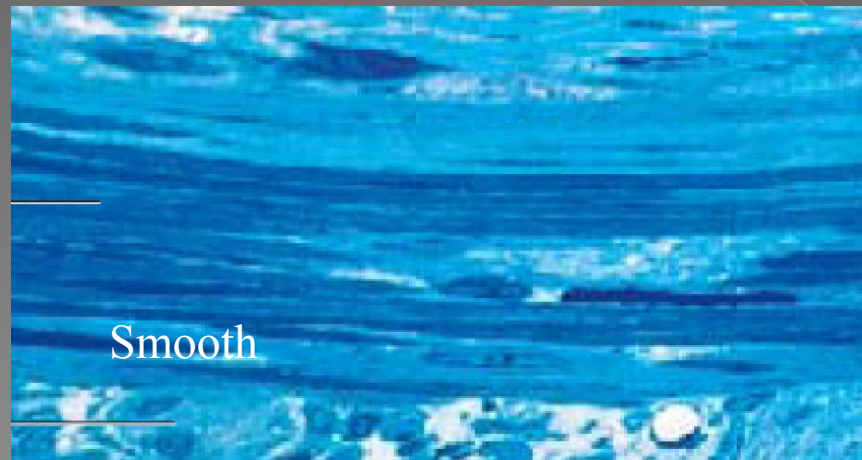
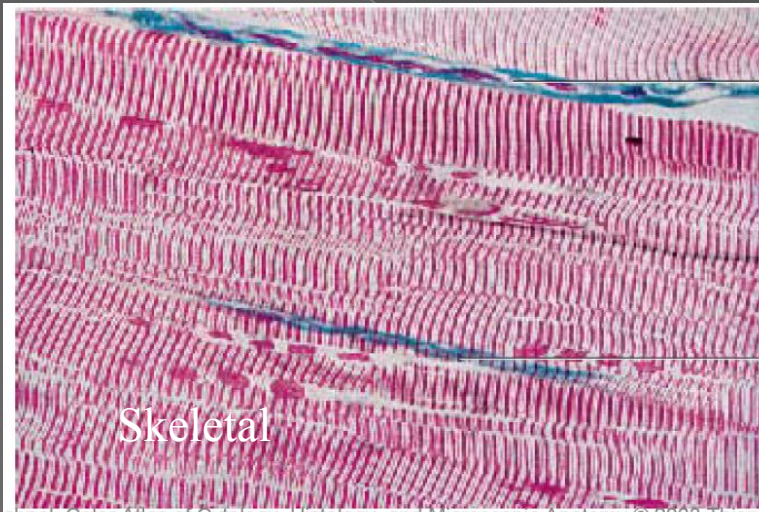
The muscle produce contraction that move the body parts, including the internal organs. It also give the form of the body and provide heat.

There are three types of muscles;

skeletal,
cardiac,
and smooth.



Although they are two from histological point of view (striated and non-striated), this is because both skeletal and cardiac muscle are striated.



Skeletal Muscles:

Most skeletal muscles are attached directly or indirectly through tendons to the bones, cartilage, ligaments, fascia, skin, organ, or mucous membranes.

When a muscle contracts and shortened, one of its attachments usually remain fixed and the other one moves. The muscle attachment commonly described as origin (usually the proximal that remain fixed when muscle contract) and insertion (usually the distal end that is movable).

The skeletal muscles are often called voluntary muscles because individual can control many of them at will, although some of their action is automatic like the diaphragm.

The architecture and shape of skeletal muscle vary, the fleshy part is the muscle belly and the part that attached to the bone is the tendon. Some time the tendon take the shape of flat sheet called aponeuroses.

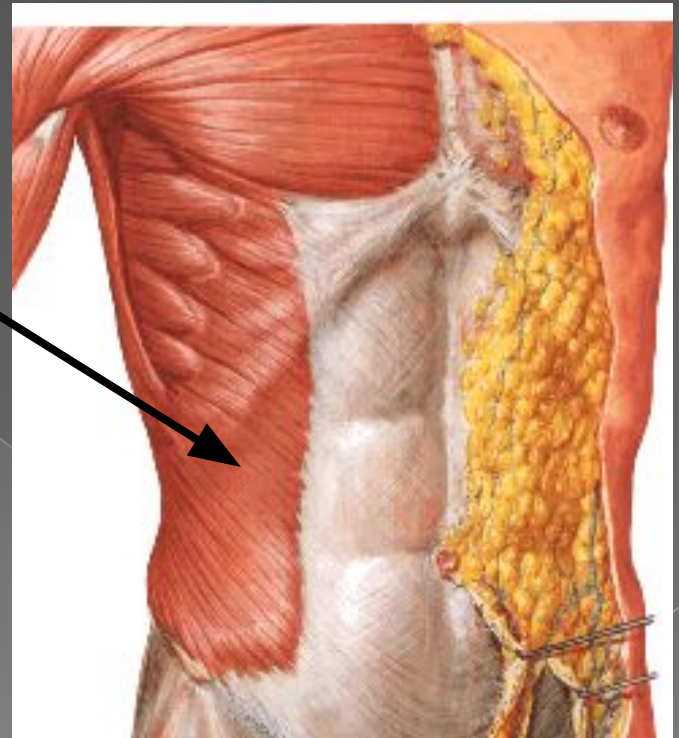
Muscle belly

Muscle tendon

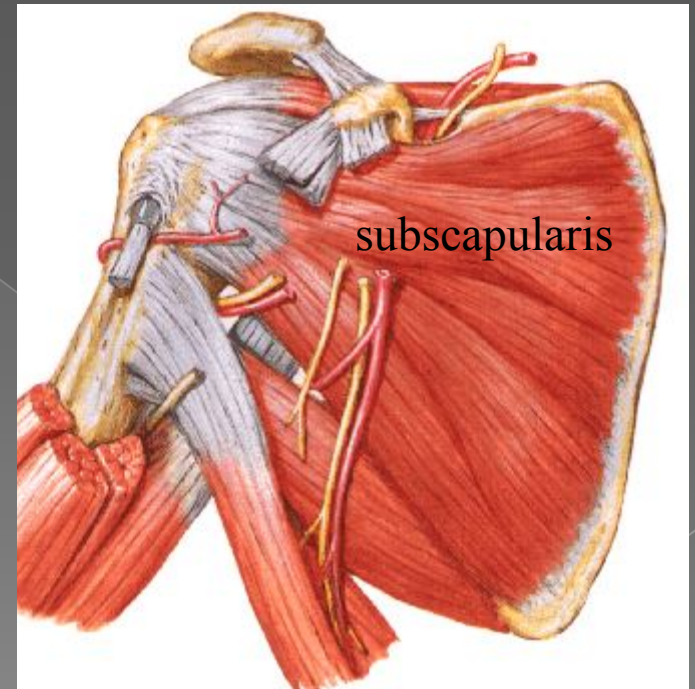
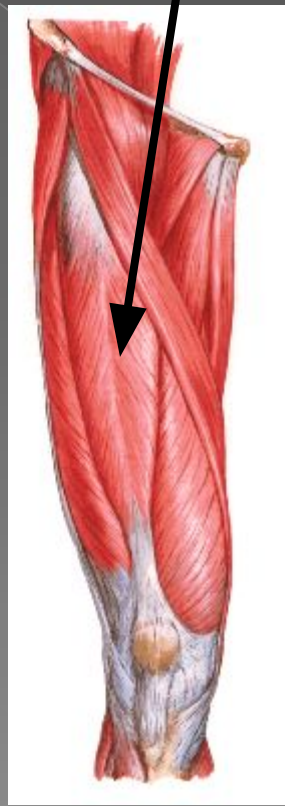
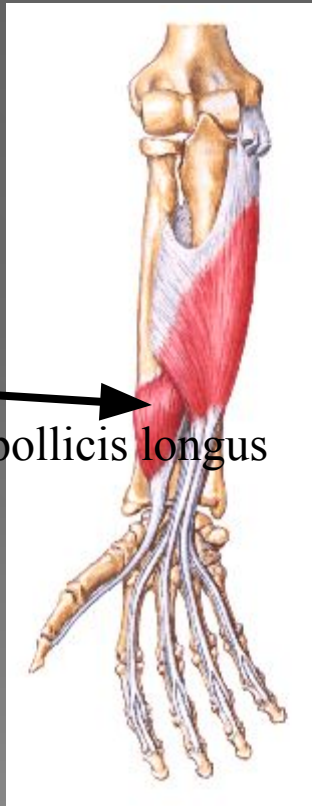


Muscles may be classified according to their shape:

- Flat muscle: their fibers are parallel and often has aponeuroses. e.g. external oblique muscle.

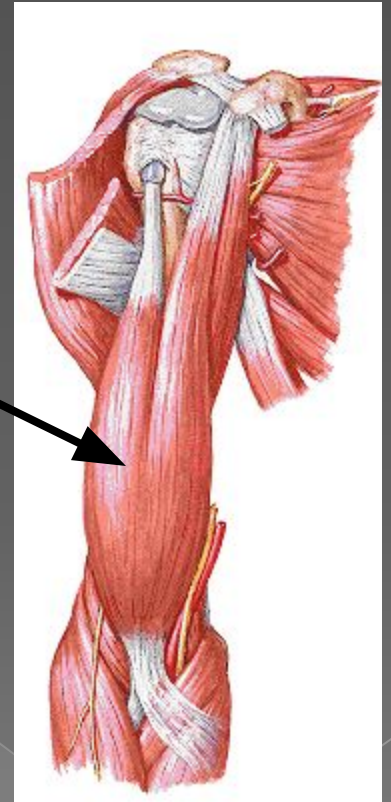


- Pinnate muscle: which are feather like according to arrangement of their fibers. They are either unipennat like flexor pollicis longus, or bipennate like rectus femoris muscle, or multipennate like subscapularis muscle.



Flexor pollicis longus

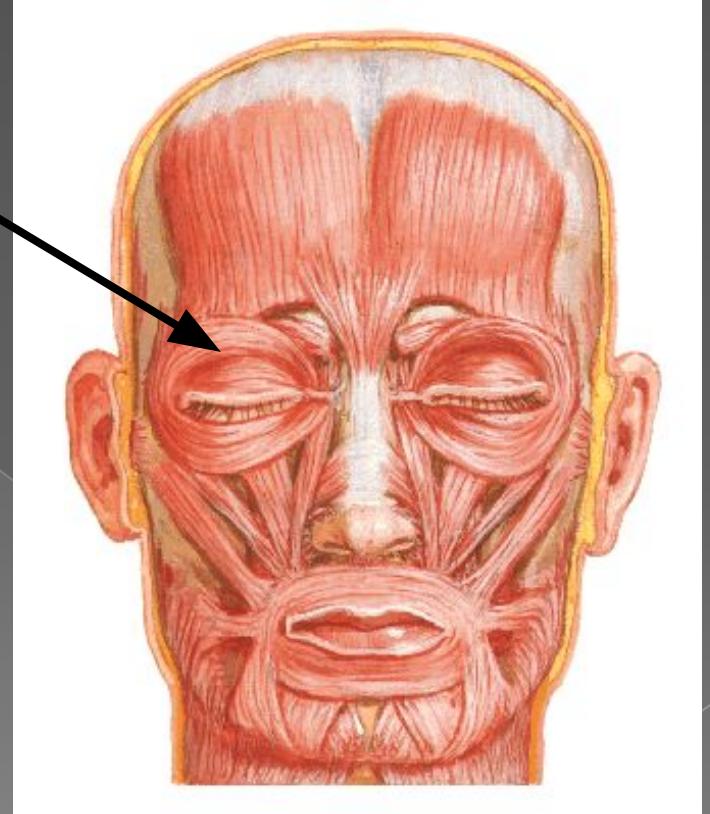
- Fusiform muscle: which is a spindle- shaped e.g. biceps brachii muscle



• Quadrate muscle: which has four equal sides e.g. pronator quadratus muscle.

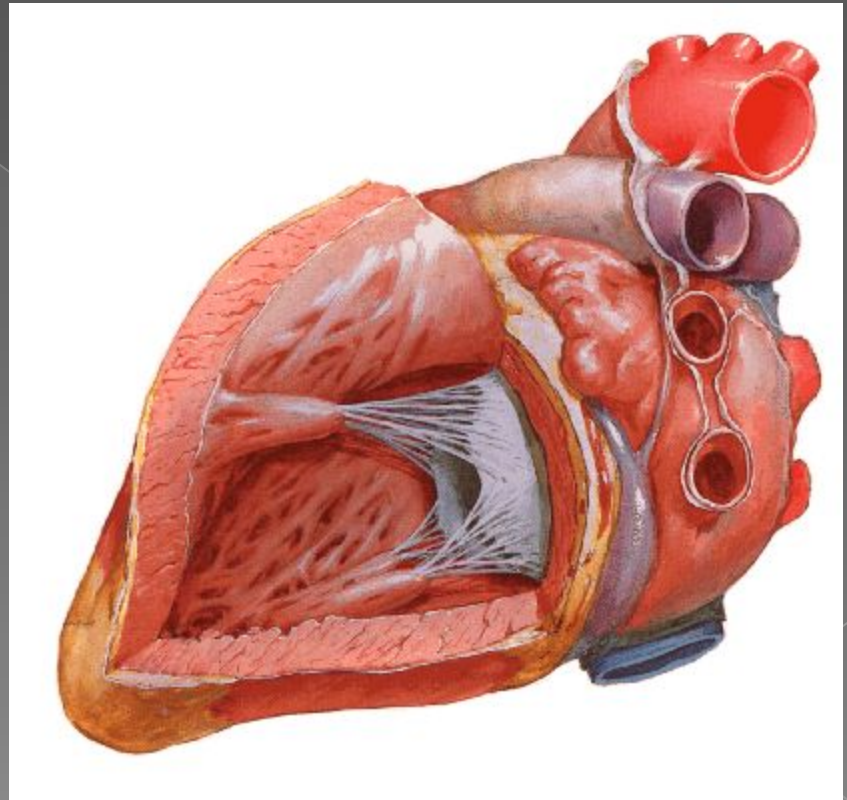


- Circular or sphincteral muscle: which surrounds a body opening and constricting it when contracted, e.g. orbicularis oculi muscle.



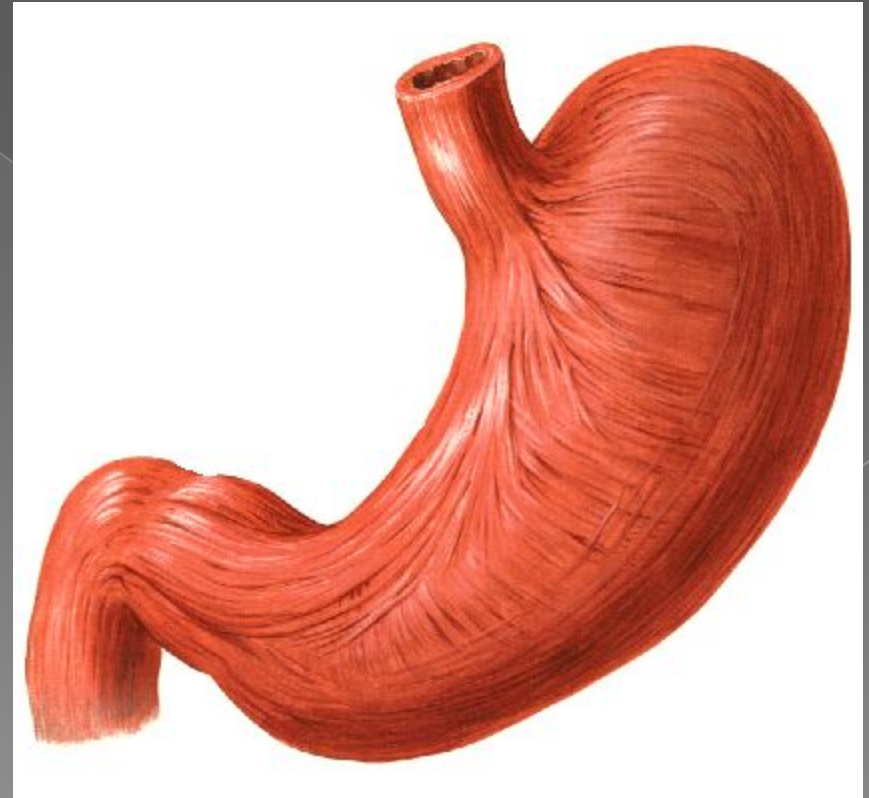
Cardiac Muscle:

It forms the muscular wall of the heart, some cardiac muscle is also present in the walls of the aorta, pulmonary vein, and superior vena cava (SVC). The cardiac muscle is involuntary, it is a type of striated muscle.



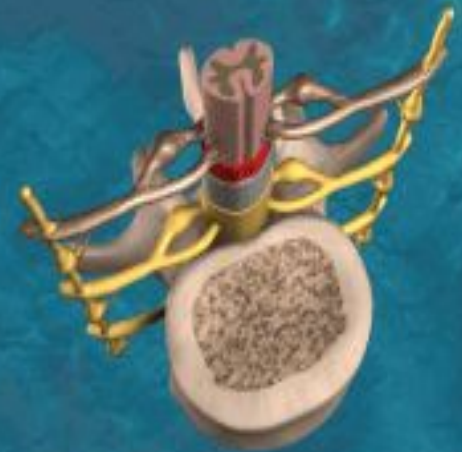
Smooth Muscle:

It is so called because lack of striation. It forms a large part of middle layer (tunica media) of the walls of most blood vessels and the muscular part of the wall of the digestive tract. It also present in the skin and the eyeball. Smooth muscle is involuntary in contraction.



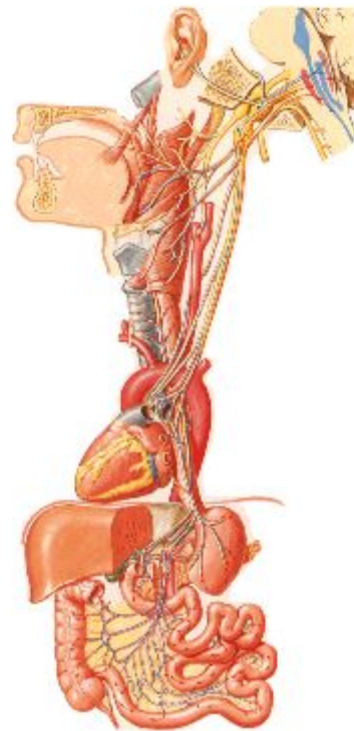
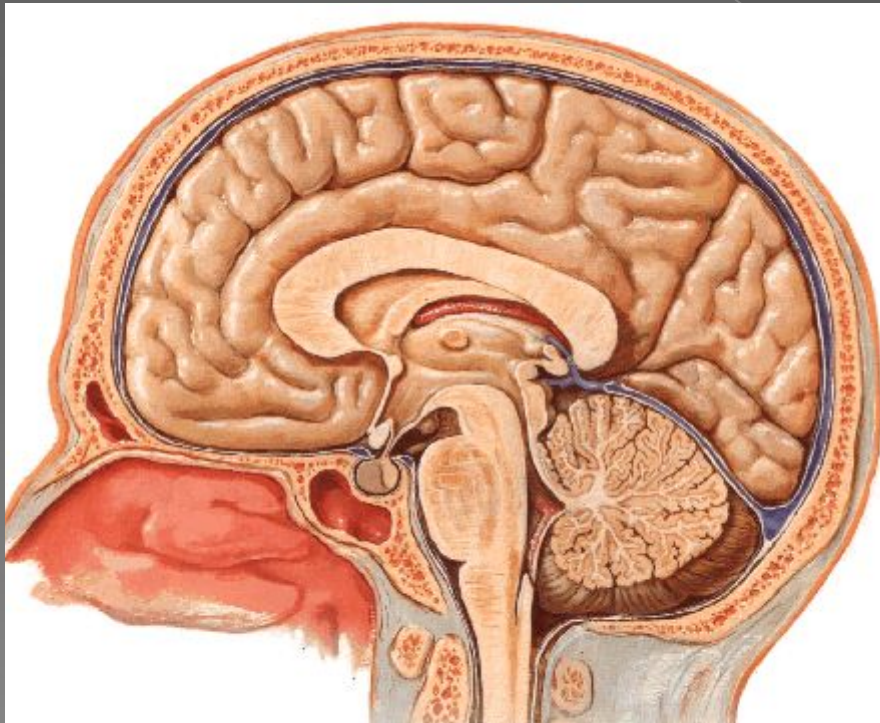


The Nervous System



Nervous System:

The nervous system enable the body to react to continuous changes in the internal and external environments. It also control and integrates the various activities of the body, such as circulation and respiration.



For descriptive purposes it is divided to:

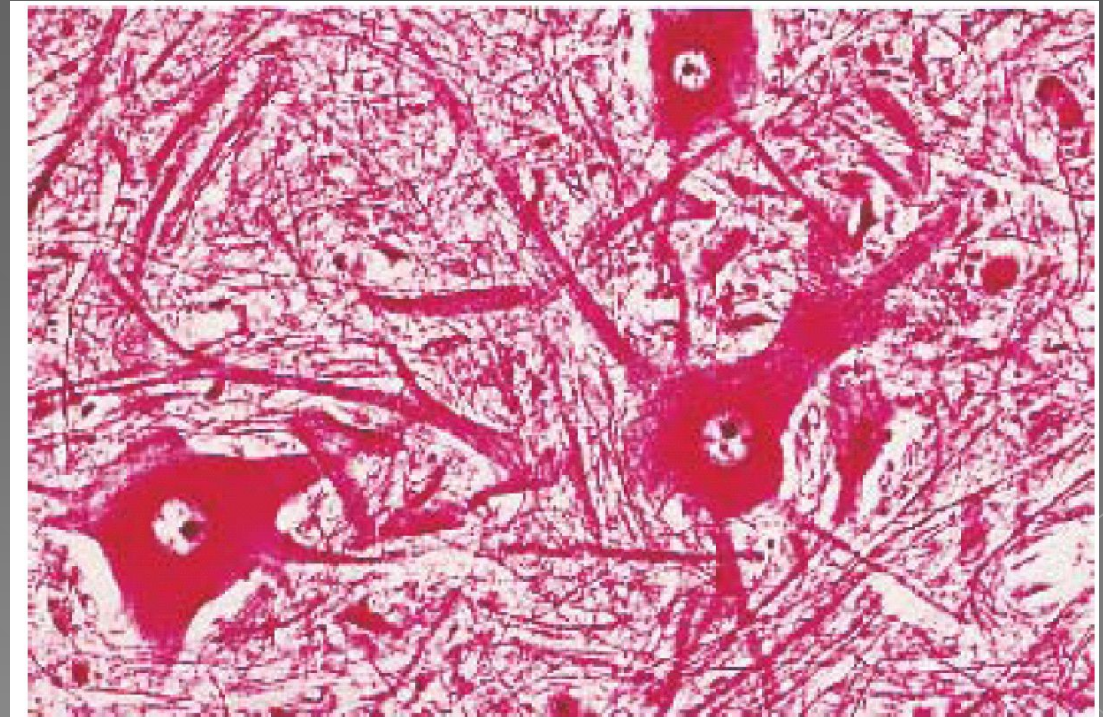
- structurally into central (CNS) and peripheral nervous systems (PNS).
- functionally into somatic (SNS) and autonomic nervous systems (ANS).

The nervous tissue consist of two main types of cells:

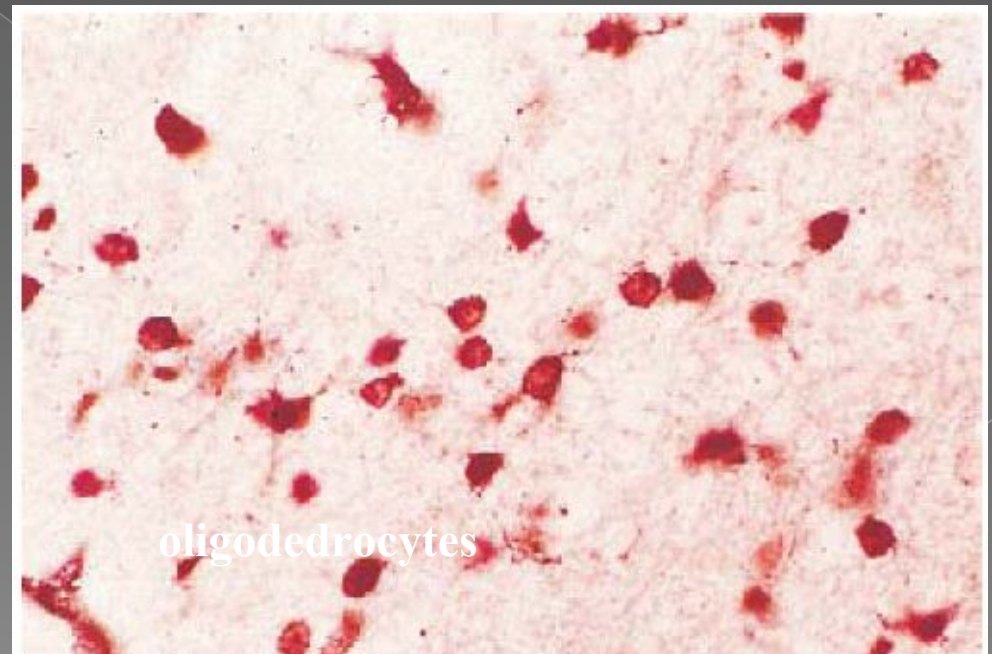
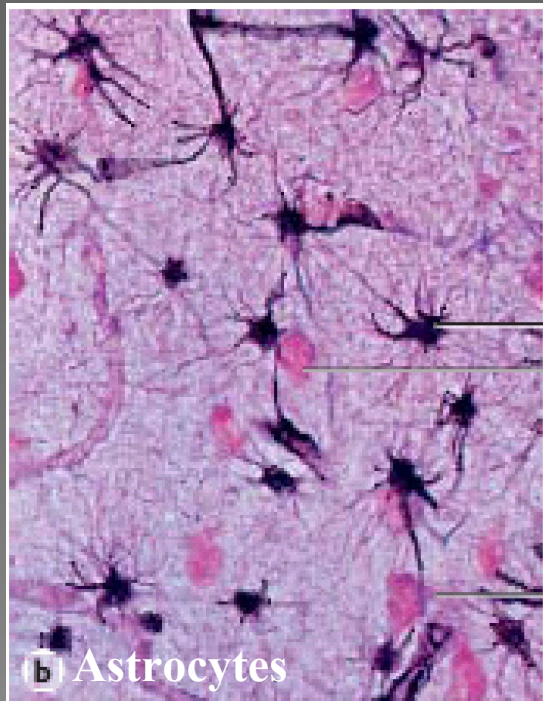
- **Neurons** (nerve cells).
- **Neuroglia** (glia cells) that support the neurons.

The neurons is the structural and functional unit of the nervous system. It is composed of a **cell body** and **processes** (dendrites and the axon). **Myelin** is a layer of lipid and protein which form the myelin sheath around some axons.

Neurons communicate with each other at **synapses** (point of contact between neurons).

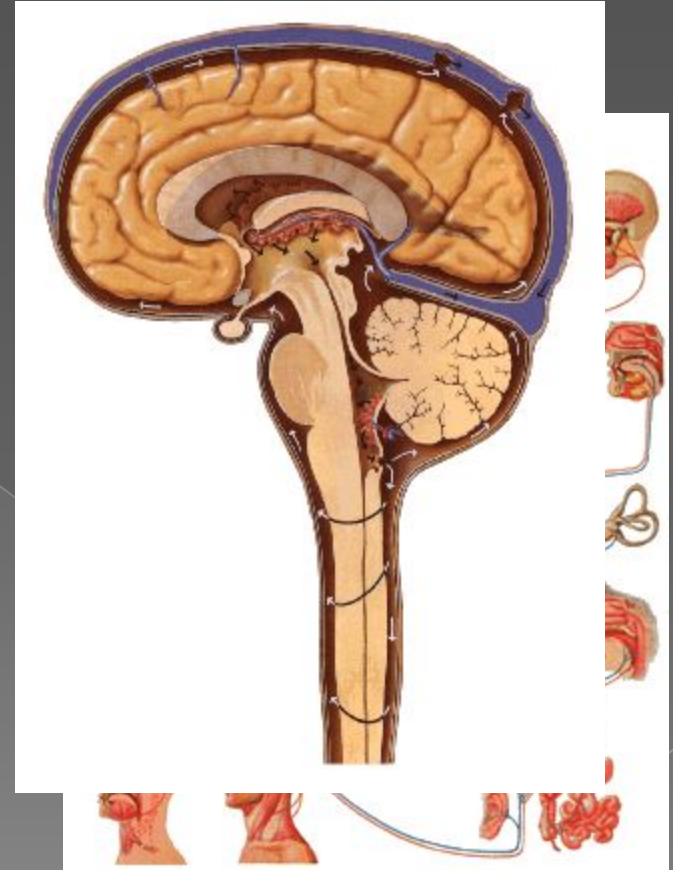
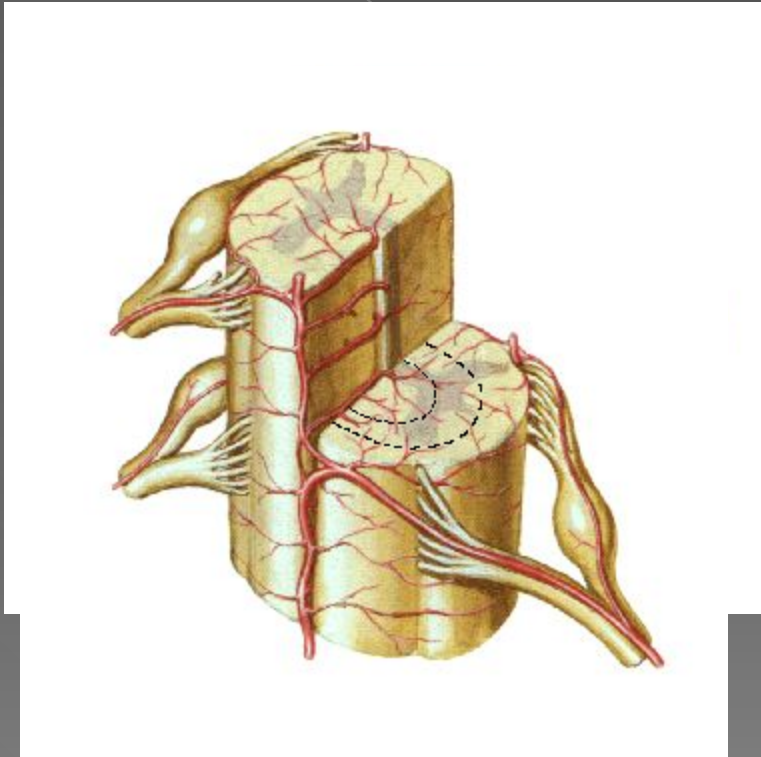


The neuroglia are usually more abundant than neurons (about five times) are nonexcitable, nonneuronal cells responsible for supporting, insulation, and nourishing of neurons. In the CNS neuroglia include the **oligodendroglia**, **astrocytes**, **ependymal cells**, and **microglia**. In the PNS neuroglia include the **satellite cells** and the **neurolemma** (Schwann) cells.



The CNS consist of brain and spinal cord.

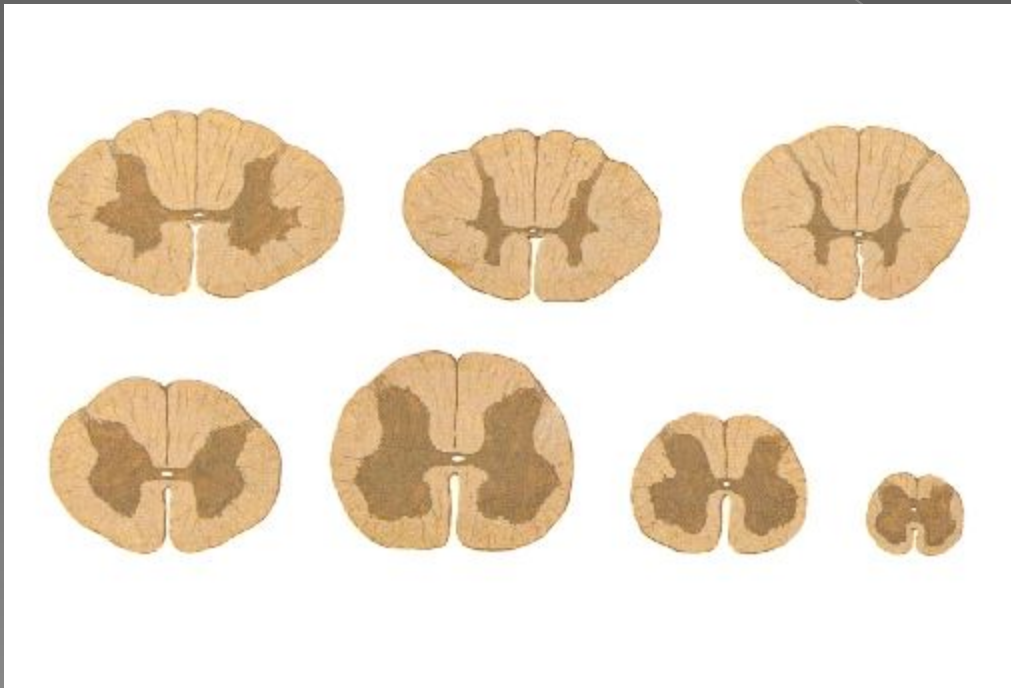
The PNS consist of cranial nerves and spinal nerves and their associated ganglia.



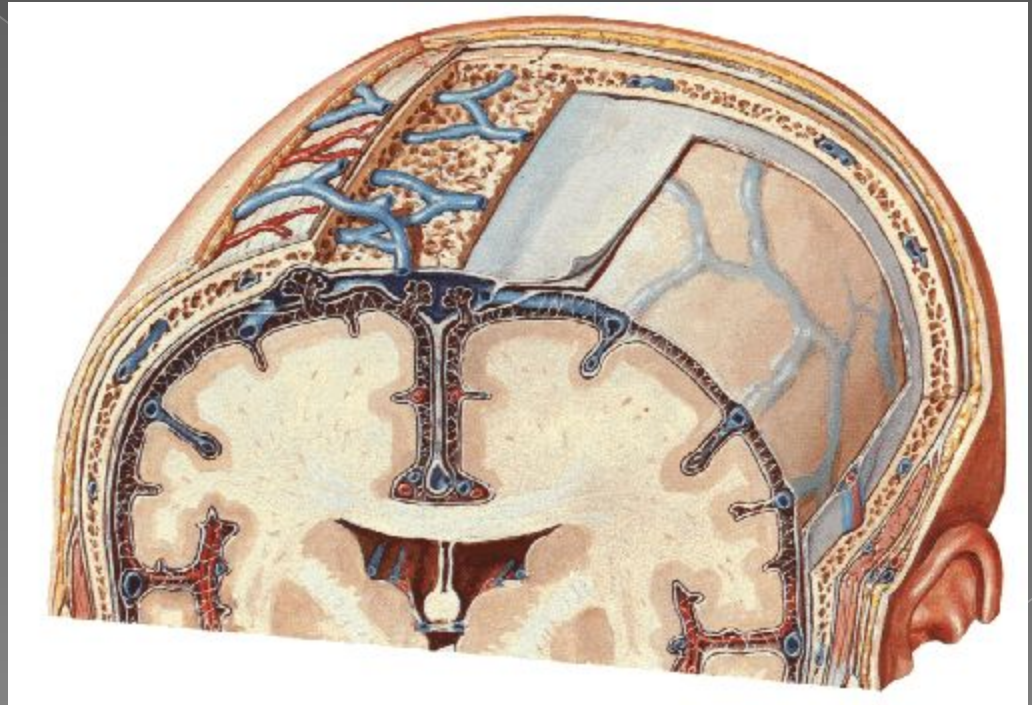
Central Nervous System:

It include the brain and the spinal cord. The collection of cell bodies in the CNS is called **nucleus**, the bundle of nerve fibers (axons) connecting neighboring or distant nuclei of the CNS is called **tract**.

The section through brain or spinal cord reveal that they are composed of gray matter and white matter. The nerve cell bodies lie within and constitute the gray matter, the interconnecting fiber tract form the white matter.



There are three membranous layers (pia mater, arachnoid mater, and dura mater, collectively called meninges), and the cerebrospinal fluid (CSF) surround and protect the CNS.



The Spinal Nerves:

There are 31 pairs of spinal nerves: 8 cervical, 12 thoracic, 5 lumbar, 5 sacral, and 1 coccygeal. Each spinal nerve is formed by the union of **anterior** (ventral) and **posterior** (dorsal) **root**, the union take place within the intervertebral foramen.

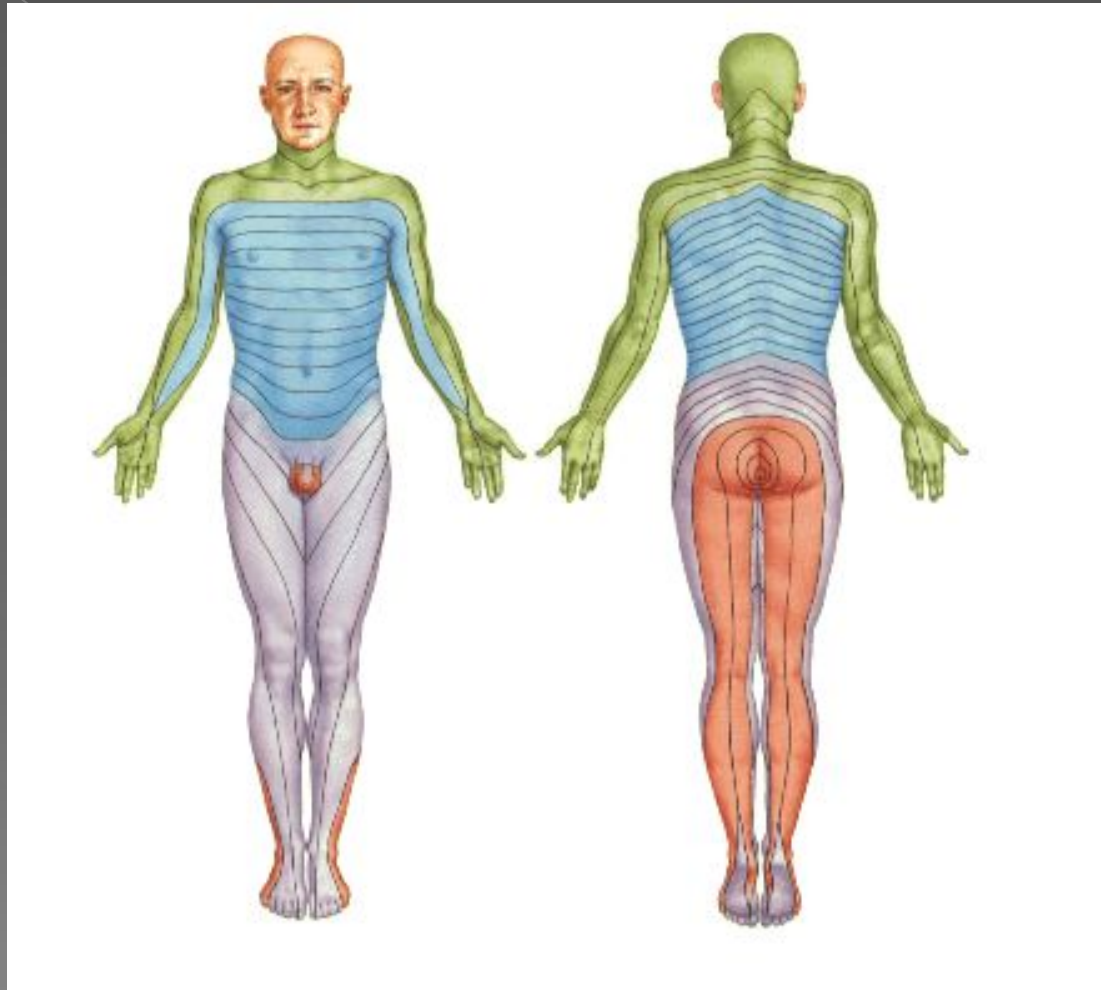
The anterior root of every spinal nerve contain motor (efferent) fibers for skeletal muscle, it also contain a small number of unmyelinated afferent pain fibers.

The posterior root contains sensory (afferent) fibers whose cell bodies are in the posterior root ganglia.

After the formation of the spinal nerve it divides into **anterior** and **posterior ramus**, the anterior rami which form the plexuses while the posterior rami do not.



The area of skin supplied by a single spinal nerve is called a **dermatome**.



**You can find the lecture on you tube through
this link**

**[https://www.youtube.com/watch?v=EnFkFxAl
GP0&feature=youtu.be](https://www.youtube.com/watch?v=EnFkFxAlGP0&feature=youtu.be)**

The End

