**MUSCULAR TISSUES**

Muscle cells are structurally and functionally specialized for contraction, which contain two types of special protein filaments called myofilaments, including thin filaments containing actin and thick filaments containing myosin.

**There are four groups of contraction cells:**

**-Muscle cells:** Skeletal, Cardiac, Smooth cells.

**-Myoepithelial cells:** found in certain secretary gland cell(sweat gland).

**-Myofibroblast cells:** have contractile role besides collagen secretion.

**-Pericytes:** are smooth muscle like cell that surround blood vessels.

**There are types of muscles:-**

**Skeletal muscles**

**1.** Largest fiber type, each muscle fiber is cylindrical(un branched) and multinucleated.The multiple nuclei are located at the periphery of the muscle fiber**.**

**2.** Fibers show prominent, alternating light and dark bands(cross striations).

**3.**They are attached to the skeleton, so, their contraction moves the skeleton**.**

**Connective tissue investments of a skeletal muscle:**

**1.Endomysium** Reticular fibers surrounding each muscle fiber plus the external(basal) lamina.

**2.Perimysium** Dense connective tissue surrounding groups of fibers and dividing the muscle into fascicles.

**3.Epimysium** Dense connective tissue surrounding the entire muscle.

**Types of skeletal muscle fibers:**

**1.Red fibers:** contain more myoglobin and mitochondria. Their contraction is slow and steady (*slow fibers*). They predominate in postural muscles and in the limbs.

**2.White fibers:** contain less myoglobin and fewer mitochondria. They react quickly(*fast fibers*). They predominate in the extra ocular muscles.

**3.Intermediate fibers:** have structural and functional characteristics between those of red and white fibers but are considered a subclass of .

**Cardiac muscle**

1.Cardiac muscle fibers exhibit some of the features seen in the skeletal muscles.

2.Cardiac muscles branch without much change in their diameters. Each cardiac muscle fiber is shorter and contains a single, centrally located Binucleate (two nuclei) also are seen occasionally.

3.Characteristic feature of the cardiac muscles are the intercalated disks.

These disks are dark-staining structures. They represent the specialized junctional complexes between adjacent cardiac muscle fibers.

4.Cross-striations and bands identical to skeletal muscle are present, but not as prominent.

5.Cardiac muscle occurs only in the myocardium of the heart.

6.Some cells of cardiac muscle are modified and function as a conducting system that helps to coordinate the heart beat. These modified cells are the functional elements of the sinoatrial nodes, atrioventric ular node, and the purkinje fibers.

**Smooth muscle**

1.Smallest fiber type, Un branched spindle-shaped fibers are elongated with tapering ends

2.Possess a single, centrally placed, oval nucleus, which can appear spiraled or ''inch-worm''- shaped when the fiber is contracted.

3.Nonstriated.

4.Smooth muscle is also prominent in the walls of blood vessels , many respiratory passage ways and some genetic ducts.

5.For distinguishing smooth muscle from the surrounding connective tissue.

Smooth muscle presents pink appearance in Hematoxylin and eosin preparations, while fibers of the connective tissue are considerably more retractile and appear bright pink and shiny by comparison.

**Types of smooth muscle fibers**

**1.Visceral smooth:** muscle are found in the walls of the hollow thoracic, abdominal, and pelvic organs.

**2.Vascular smooth muscle:** around developing blood vessels.

**3.Smooth muscle of the iris:** The sphincter and dilator papillae muscles.