

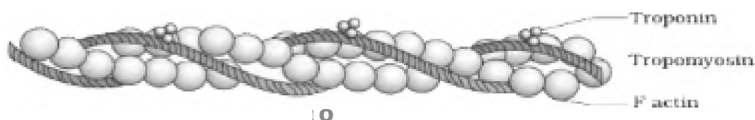
LOCOMOTION AND MOVEMENT

Muscles are specialized tissues of mesodermal origin. They have property like excitability, contractility, extensibility and elasticity.

Skeletal Muscles is made up of *myofibrils* (bundles of *myofibrils*), held together by collagenous connective tissue called **fascia**.

Light bands contain actin and is called **I. band** (Isotropic band) and dark band contain myosin, called **A. band** (anisotropic band). Both bands are present parallel to each other in longitudinal fashion.

- In centre of each I-band is elastic fibre called **Z line**. In the middle of A-band is thin fibrous 'M' line. The protein of myofibrils between two successive Z lines. Is the functional unit of contraction called a **sarcomere**.
- At resting stage thin filament overlaps the thick filament. The part of thick filament not overlapped is called 'H' zone.



- The mechanism of muscle contraction is explained by **sliding mechanism theory** in which thin filament slide over thick filament.
Red fibres (aerobic muscles) contain myoglobin that has plenty of mitochondria to produce large amount of oxygen stored in them. The muscle fibres containing less number of myoglobin are called white fibres.

Skeletal System

Framework of bones and cartilage forms the skeletal system. In human beings, it consists of 206 bones and some cartilage. The two principle division of skeletal system are

a. **Axial Skeleton** (without bones) includes skull, vertebral column, sternum and ribs constitute axial system.

The skull (22 bones) is composed of **cranial** and **facial** bones. Cranial (8 bones) forms protective covering for brain (cranium). The facial region consists of 14 skeletal systems that form front part of skull. Hyoid bone (U-shaped) forms the base of buccal cavity.

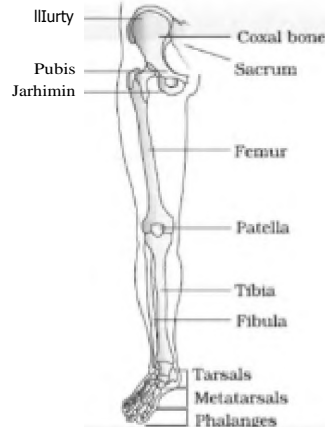
- The middle ear bone (Malleus, Incus and Stapes) collectively called **Ear Ossicles**, Skull joins with vertebral column with two occipital condyle.
- Vertebral column consists of 26 serially arranged vertebrae. First vertebra is atlas that articulates with occipital condyle other include Cervical -7, thoracic -12, lumbar -5, sacral -1 coccygeal -1.

Enolliall bone

E:1:oul !Wm&

Lower LIM!)

Femur, tibia and fibula, 7-tarsal.. 5-metataral, 14-phalanges, cup shaped patella cover the knee.



Cartilaginous joints - bones are held together with the help of cartilage present in vertebrae_ Permits limited movements.

www.FirstRanker.com

III. Synovial joints- fluid filled synovial cavity, provide considerable movements. Ball and socket joint, hinge joints, pivot joints, gliding joints etc.

Disorders of Muscular and Skeletal System

- **Myasthenia gravis**- autoimmune disorder affecting neuromuscular junction causing fatigue, weakening and paralysis of skeletal system.

- * **Muscular Dystrophy**- degeneration of skeletal muscles due to genetic disorder.

- **Osteoporosis** — decreased bone mass in old age leading to chance of fracture due to decreased estrogen.

- **Arthritis**- inflammation of joints.

- **Gout**- inflammation of joints due to accumulation of uric acid crystals,