

**Fascicles**

A bundle of muscle fibres

Many fascicles held together by fascia (collagenous connective tissue) to form a skeletal muscle

**Sarcolemma**

The plasma membrane of a muscle fibre

**Sarcoplasm**

The cytoplasm of a muscle fibre

Sarcoplasmic  
reticulum

The endoplasmic reticulum  
of a muscle fibre, which  
stores Calcium ions

Sarcomere

The functional unit of  
contraction

Part of a myofibril  
between two  
consecutive 'Z' lines

Thin or Actin  
filaments

Attached to the 'Z' line  
(elastic fibre)

Made up of:- 'F'-actin, which  
is a polymer of 'G' (globular)  
actin, Tropomyosin and  
Troponin, which masks the  
active binding sites of  
myosin

## Thick or Myosin filaments

Attached to the 'M' line in the middle (thin fibrous membrane)

Monomeric unit- Meromyosins  
Heavy meromyosin (HMM)- globular head and short arm  
Light meromyosin (LMM)- tail

## Globular myosin head

ATPase activity

The binding site for calcium ions and actin filament

## Anisotropic ('A') or dark band

Formed by overlapping actin and myosin filaments

The length remains the same during contraction

Isotropic ('I') or light band

Made up of actin filaments

The length reduces during muscle contraction

'H' Zone

The middle portion of the thick filament, which is not overlapped by the thin filament in the resting state

Muscle fatigue

Anaerobic breakdown of glycogen leading to lactic acid accumulation

Occurs due to repeated activation and low oxygen availability

Red fibres

Aerobic muscles

Myoglobin content is high

Large amount of mitochondria are present

White fibres

Anaerobic muscles

Myoglobin content is low

Fewer mitochondria but more sarcoplasmic reticulum

Cranial bones

8 in number

Frontal, parietal (2), temporal (2), occipital, sphenoid, ethmoid

Facial bones

14 in number

A pair of lacrimal, nasal, zygomatic, maxillae, palatine, nasal conchae and one vomer and mandible (lower jaw, movable)

Hyoid bone

A single u-shaped bone at the base of the buccal cavity

Atlas

First vertebra, which articulates with the occipital condyles of skull

Vertebral column

Made up of 26 vertebrae

Cervical- 7

Thoracic- 12

Lumber- 5

Sacral- 1 (fused)

Coccygeal- 1 (fused)

Sternum

One flat bone present ventrally

Ribs

12 pairs

True ribs- 1<sup>st</sup> to 7<sup>th</sup>

Vertebrochondral or false ribs- 8<sup>th</sup> to 10<sup>th</sup>

Floating ribs- 11<sup>th</sup> and 12<sup>th</sup>

Rib cage

Thoracic vertebrae,  
ribs and sternum

Forelimb

30 bones

Humerus, radius, ulna,  
carpals (8, wrist bones),  
metacarpals (5, palm),  
phalanges (14, digits)

Hindlimb

30 bones

Femur (longest bone), tibia,  
fibula, patella (knee cap),  
tarsals (7, ankle bones),  
metatarsals (5, sole),  
phalanges (14, digits)



## Pectoral girdle

Each half is made up of clavicle (collar bone) and scapula

Head of the humerus articulates with the glenoid cavity, forming shoulder joint

## Pelvic girdle

2 coxal bones, each coxal bone is made up of ilium, ischium and pubis

Head of the femur articulates with acetabulum cavity

## Pubic symphysis

Formed by two halves of the pelvic girdle joined ventrally by fibrous cartilage

## Fibrous joints

No movement

Bones are joined by dense fibrous connective tissues

E.g. skull bones in the cranium

## Cartilaginous joints

Limited movement

Bones are joined by cartilage

E.g. vertebrae in the vertebral column

## Synovial joints

Considerable movement

Synovial cavity between articulating surfaces of two bones

E.g. Pivot joint- between atlas and axis

Saddle joint- between carpal and metacarpal of the thumb

Gliding joint- between the carpals, Ball and socket, Hinge joint, etc.

## Myasthenia gravis

Autoimmune disease of the neuromuscular junction

Antibodies destroy or block the acetylcholine receptors

## Muscular dystrophy

Genetic disorder due to defective gene

Progressive weakness and degeneration of skeletal muscles

## Tetany

Metabolic disorder due to calcium deficiency

Continued contractions leading to rapid spasms

## Tetanus

Bacterial disease, caused by  
*Clostridium tetani*

Also known as lockjaw,  
painful muscle spasms

## Osteoporosis

Age-related disease

Decreased bone mass

Low estrogen level is a  
common cause

## Gout

Metabolic disorder

Accumulation of uric acid  
crystals in joints causing  
inflammation