Muscles

All cells can move, but some cells form *multicellular contractile units* called *muscles.*

3 types of muscles:

1. Skeletal **(striated, voluntary)**
2. Smooth **(non-striated, involuntary)**
3. Cardiac **(striated, involuntary)**

These all are surrounded by an elastic lamina. The elastic lamina allows the muscle to form into a functional mass.

Contraction is stimulated via link proteins in the cell membrane.

Skeletal muscle **(striated, voluntary)**

- For movement of skeleton and organs e.g. tongue
- Arrangement of contractile proteins (actin, myosin) gives appearance of cross striations on LM, thus called *striated muscle*
- Specialised so cytoplasm is called sarcoplasm, endoplasmic reticulum is called sarcoplasmic reticulum etc
- Made of elongated multinucleate contractile cells, muscle fibres bound together by collagenous supporting tissue
- Individual fibres vary in diameter
- Contraction is controlled by a *motor nerve*.
- *Motor unit*- group of muscle fibres supplied by same nerve. When nerve fires, all fibres in the motor unit contract simultaneously
- The strength of skeletal muscle fibres depends on their nerve supply… so if the supply is damaged, the muscle fibres atrophy
- Individual muscle fibres are grouped in *fasciculi* with supporting tissue called endomysium between them
- fascicles are surrounded by loose support tissue called *perimysium*
- Muscles are made up of many fasciculi and are invested in a dense collagenous sheath- the epimysium
- Large vessels and nerves enter the epimysium and divide and spread through the muscle in the perimysium and endomysium
- Small fasciculi and a lot of perimysium= muscle involved in fine motor control e.g. eye
- Large fasciculi= muscles involved in gross movements e.g. buttocks
- *Elongated fibres, unbranched, cylindrical*
- Numerous flattened nuclei located at regular intervals, just underneath the plasma membrane (sarcolemma)

Smooth muscle **(non-striated, involuntary)**

- visceral muscle
- *under* autonomic and hormonal control