

206 bones, three muscle types, and the sliding filaments that turn a chemical signal into a pull

Movement vs Locomotion

- **movement**: internal or external, voluntary or involuntary
- **locomotion**: a change in the whole body's location, for food, shelter, mate, breeding ground or escape
- all locomotion is movement, not the reverse: peristalsis moves but does not relocate the animal
- four basic locomotory movements: **amoeboid** (pseudopodia, e.g. leucocytes)
- **ciliary** (cilia, e.g. Paramecium moving food through the cytopharynx)
- **flagellar** (flagella, e.g. sperm), **muscular** (muscles + bones + joints)

Three Muscle Types, By Control

Type	Control	Where
smooth	involuntary	peristalsis in the gut, blood vessel constriction/dilation
cardiac	involuntary, rhythmic	contraction and relaxation of the heart
striated (skeletal)	voluntary	limbs, head, trunk, eyes; attached to bone by inelastic collagen tendons

Where a Muscle Sits, and What It's Called

- the bulk of a muscle usually sits on the bone ABOVE the one it moves
- e.g. biceps and triceps, which move the forearm, sit in the upper arm
- at a joint one bone is stationary, one movable
- end on the stationary bone: **origin**; on the movable bone: **insertion**
- the thick middle is the **belly**
- fibres concentrate in the middle, taper at the ends: large muscles are **fusiform**

Three Roles in One Movement *

Agonist (prime mover)

brings about the initial movement, e.g. biceps flexing the elbow

Synergist

assists the prime mover, e.g. brachialis assisting biceps

Antagonist

brings the opposite action, e.g. triceps extending against biceps

a muscle can only **PULL**, never push, which is why opposing joints need antagonistic pairs

