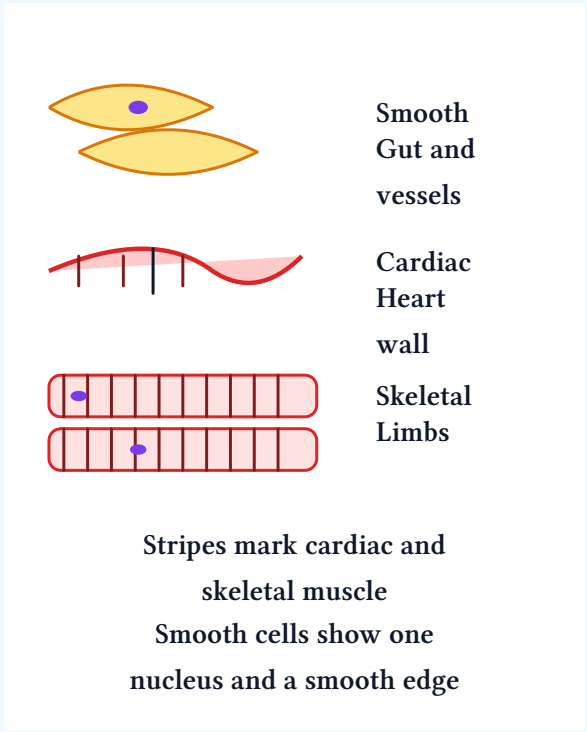
Biology 20

Unit D: Human body systems

Three muscles and the sliding filament

Three shapes under the lens

- Smooth cells taper, with one nucleus, and they serve gut and vessels.
- Cardiac cells branch in the heart wall, and skeletal fibres are long and striped in the limbs.



Each tissue holds up other systems

- Smooth muscle moves food and changes vessel width.
- Cardiac muscle pumps blood through both circuits.
- Skeletal muscle breathes, stands, and walks, and it makes heat.

Key terms

cardiac muscle

The striped, branching muscle of the heart wall that pumps blood.

sarcomere

The repeating unit of a striped muscle fibre, from one Z line to the next.

actin

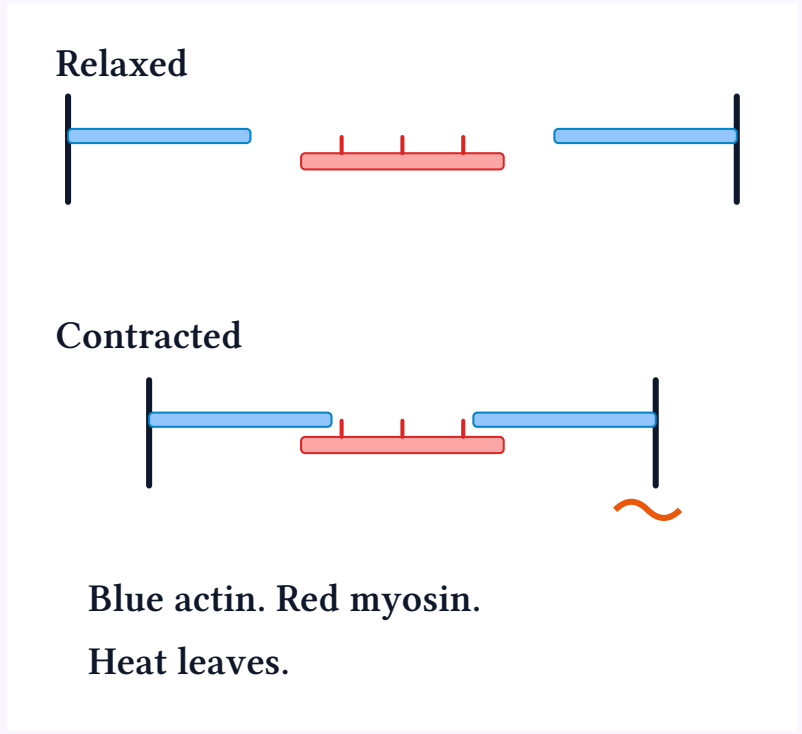
The thin filament, drawn in blue, that slides inward over myosin.

myosin

The thick filament, drawn in red, that pulls on actin during contraction.

The filaments slide and stay long

- Blue actin and red myosin keep their length in both drawings.
- The contracted sarcomere has closer Z lines and more overlap.
- A small heat mark leaves the working sarcomere.



A paper sarcomere

- Record actin length and myosin length before the slide.
- After the Z lines move closer, those lengths read the same.

Tissues and organ jobs

- Peristalsis in the intestine is smooth muscle.
- The heartbeat is cardiac muscle, and a step is skeletal muscle.

Tissue and slide

- Tell the three muscle tissues apart with one visual clue each.
- Describe the sliding filament and the heat that leaves.

More lifts, more heat

- The heat mark on the contracted sarcomere can be measured.
- The next lesson compares one lift with many lifts.