

Muscle Contraction

Biology

The sliding filament theory, step by step.

The cross-bridge cycle.

1

Impulse arrives

Calcium released from the sarcoplasmic reticulum.

2

Calcium binds troponin

Tropomyosin moves, exposing binding sites on actin.

3

Cross-bridge forms

Myosin head attaches to actin.

4

Power stroke

The head pivots, pulling actin inward. ADP released.

5

ATP detaches the head

No ATP means no detachment — which is rigor mortis.

WHAT SHORTENS

Sarcomere gets shorter

I band and H zone narrow

A band stays the same length

The A band's constant length is the key evidence for sliding rather than shortening filaments.