SLIDING FILAMENT THEORY

- Muscles only pull ∴ work pairs = antagonistic muscles
  (muscle bends (flex) = flexor muscle
  straightens joint = extensor muscle)

Role sarcopl ret. in contrac^{n}: (2)
- Ca^{2+} ch open
- ↳ released ⇝ sarcoplasm
- bind troponin ∴ tropomyosin moves
- ⇝ cross-bridges form

PROCESS

1. AP arrives motor end plate → diff Ca^{2+} ⇝ neurone → vesicles a·choline fuse presyn· memb
2. Acetylcholine = released & diff across synaptic cleft
3. Ach bind recepton sarcolemma ⇝ open Na^{+} ch
   ∴ Na^{+} diff in → depol^{n} (spreads along memb)
4. AP spread along memb & down T-tubules
5. Ca^{2+} diff out sarcopl·ret
6. ↳ bind troponin Δ shape
   ∴ tropomyosin moves = expose myosin-bind·sites on actin filaments.
7. Myosin heads form cross-bridges w̃ actin fil ↗ ATP → ADP + Pi
8. ↳ tilt ∴ move actin → ← centre sarcomere (shortens) = power stroke
9. E from hydrolysis ATP cause myosin heads 'reset' o·G position w̃ ATPase = break cross·bridge
   M·heads bind actin further along ↳ as ATP bind

↻ ratchet mov repeats

ATP & ATPase

Uses ATP ^:

1. actin-myosin cross bridges
2. power stroke (mov· myosin heads) [hyd. ATP]
3. Detatchment myosin heads [new ATP attatches]
4. recovery stroke (reset m·heads) [hyd. ATP]

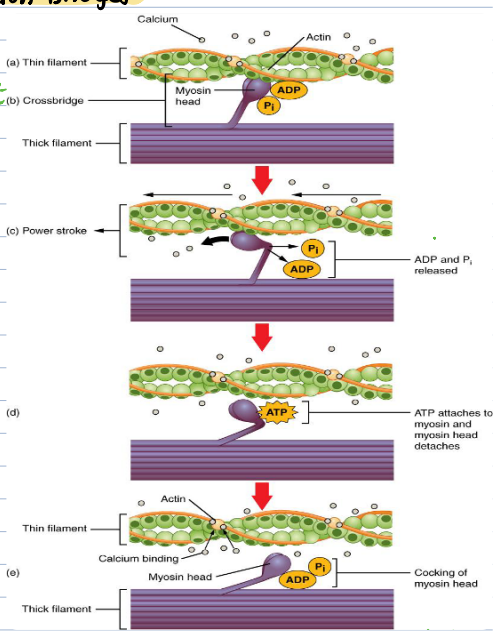
ATPase · breaks ↓ ATP ∴ prod E
↳ to break actin-myosin cross-bridges

Q: Why max tension x when sarcomere length = shortest

- max tension = max interac^{n}
- sarcomere shortest when overlap actin fil & length myosin ↓
- ↓ cross-bridges formed

Q: How sarcomere shortens

- act-my cross bridge formed
- tilt m·head
- pull actin closer (moves)
- req ATP
- proces repeats = ratchet



PRACTICAL

1. Fibres of fresh meat
2. In Ringer's soln (w glucose vs w ATP)
3. Place on microscope slide
4. Record Δ length (%)
5. Add 1 drop ATP soln
6. Control = distilled water

After death, cross bridges remain bound ↗ rigor mortis
Suggest why:
- resp^{n} stops
- X ATP prod
- = req for break cross bridges & X Ca^{2+} come

Control:

- Ringer soln alone
  ∴ show ↑ it by self ↛ cause contrac^{n} (only w ATP)

Method

1. Dil & 5 dil %
2. Control w Ringer's soln alone
3. Ruler mm measure Δ length fibres
4. Leave fibres 2 mins b4 ↑ (same time)
5. use same mass + SA fibres
6. add same vol ATP soln for each conc & add $1cm^3$ on slide
7. ATP soln = irritant ∴ gloves
8. Repeat x3 + mean.

Why results may X be valid

- may be dead
- Δ thickness strips (variable length

Q: Tropomyosin role 'SFT'

1. covers my· binding sites on actin
2. When Ca^{2+} bind troponin, tropomyosin moves
3. allow form cross-bridges (my· bind act.)

Q: Role myosin 'SFT'

1. hyd ATP ⟶ ADP + Pi
2. ∴ ↝ m·head tilt
3. m.head bind act ∴ form cross-bridges w act
4. ADP & Pi detatch
5. m·head swings back ⟶ prev. position
6. power stroke occurs (moves actin →←)
7. (new) ATP binds
8. cross-bridges break (∴ m·head detatches from actin)