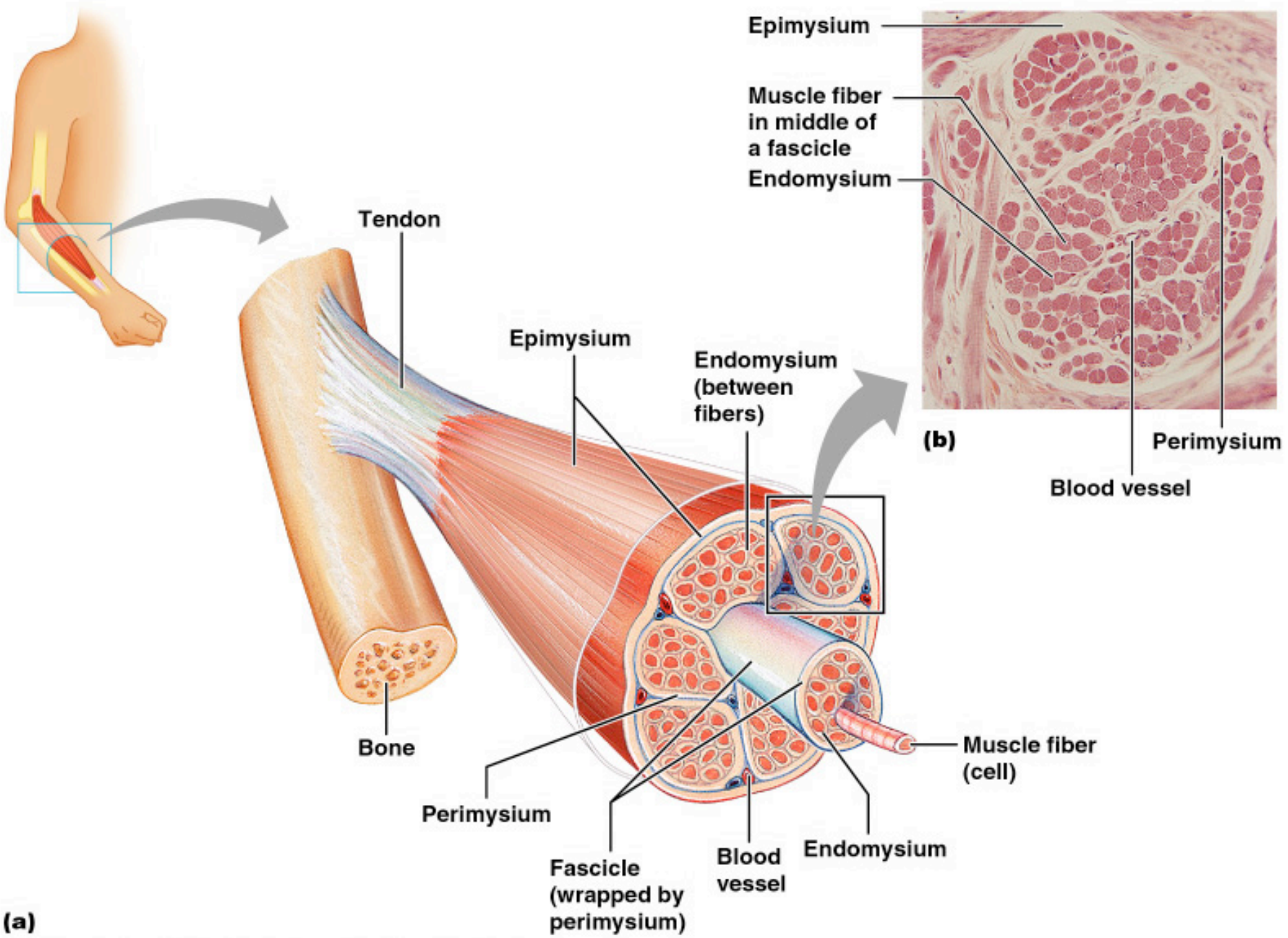
Muscle Physiology

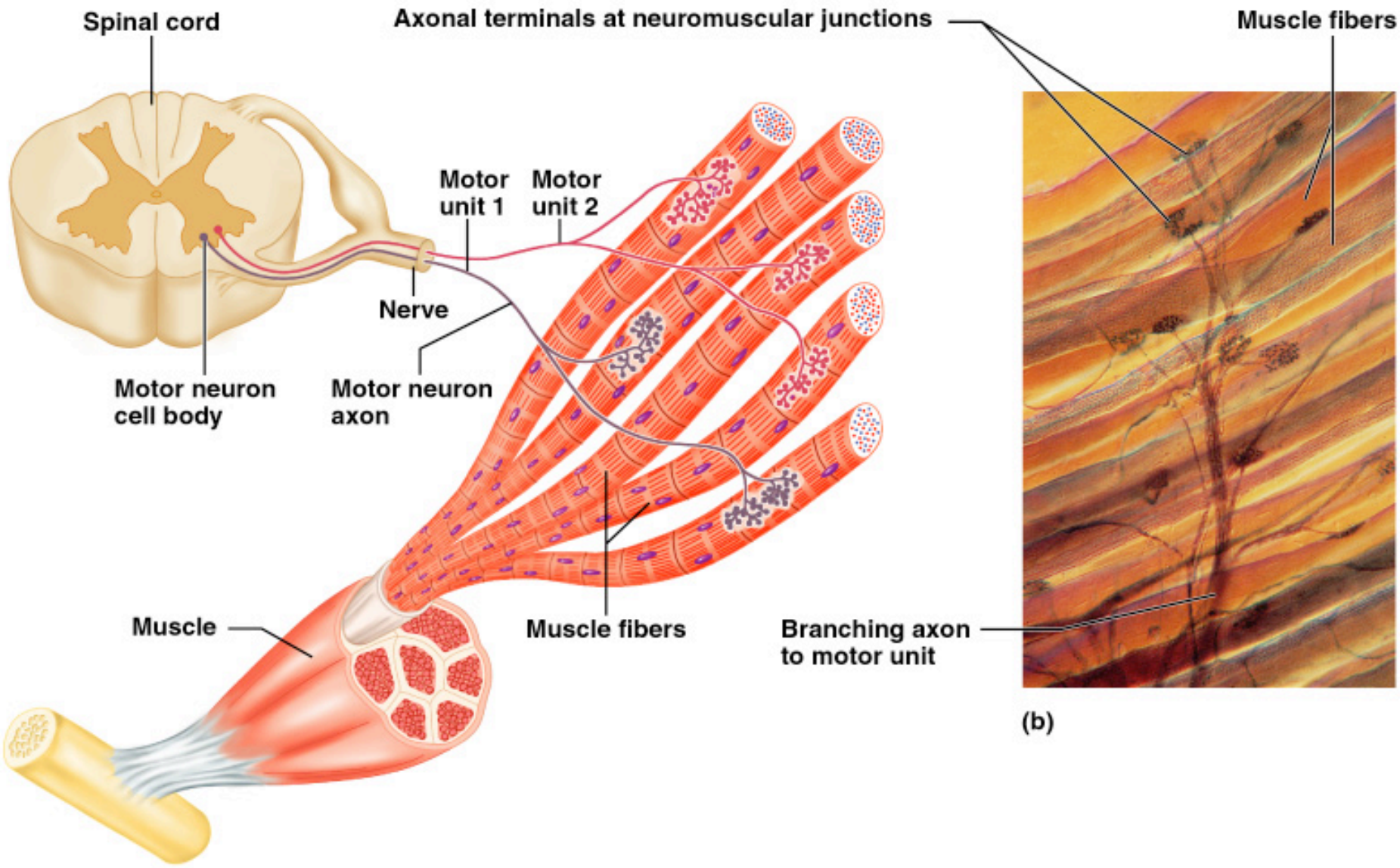
Learning Targets

I can:

- Describe how muscle fibers contract
- Explain how toxins and drugs can influence muscle contractions
- Explain the role that calcium and protein play in muscle contraction

Setting the stage…





Homework-Structure of a Muscle

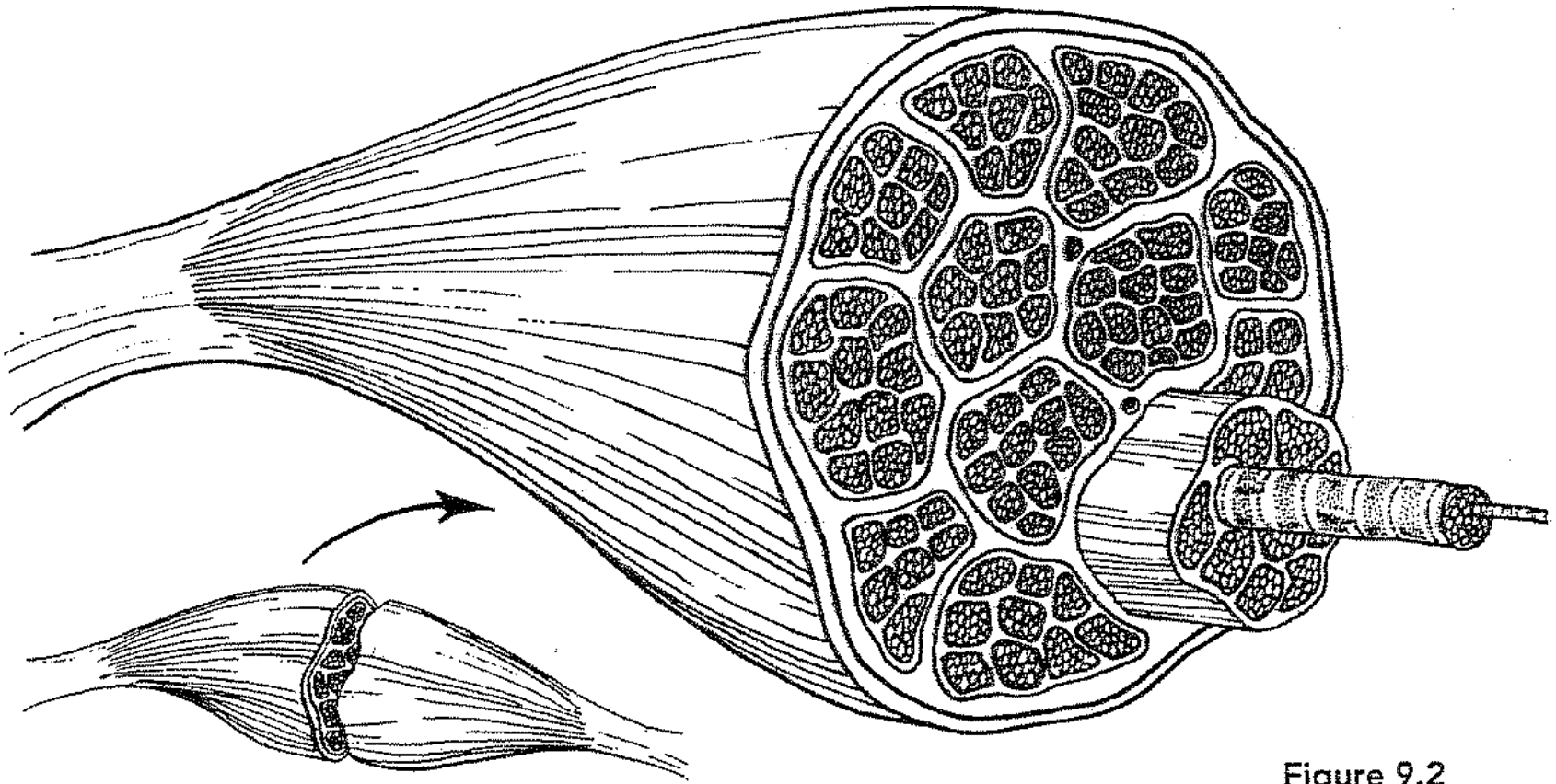
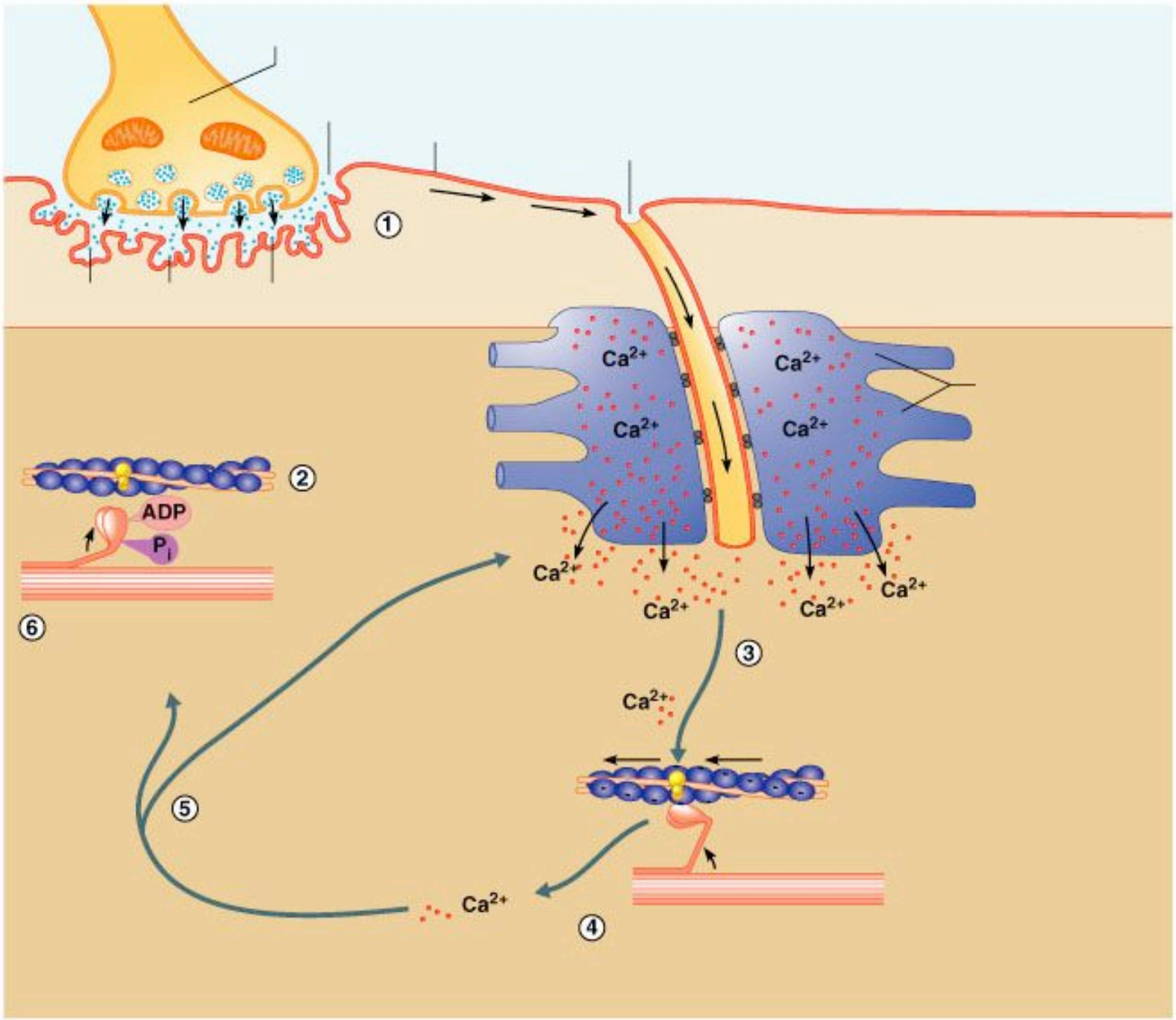
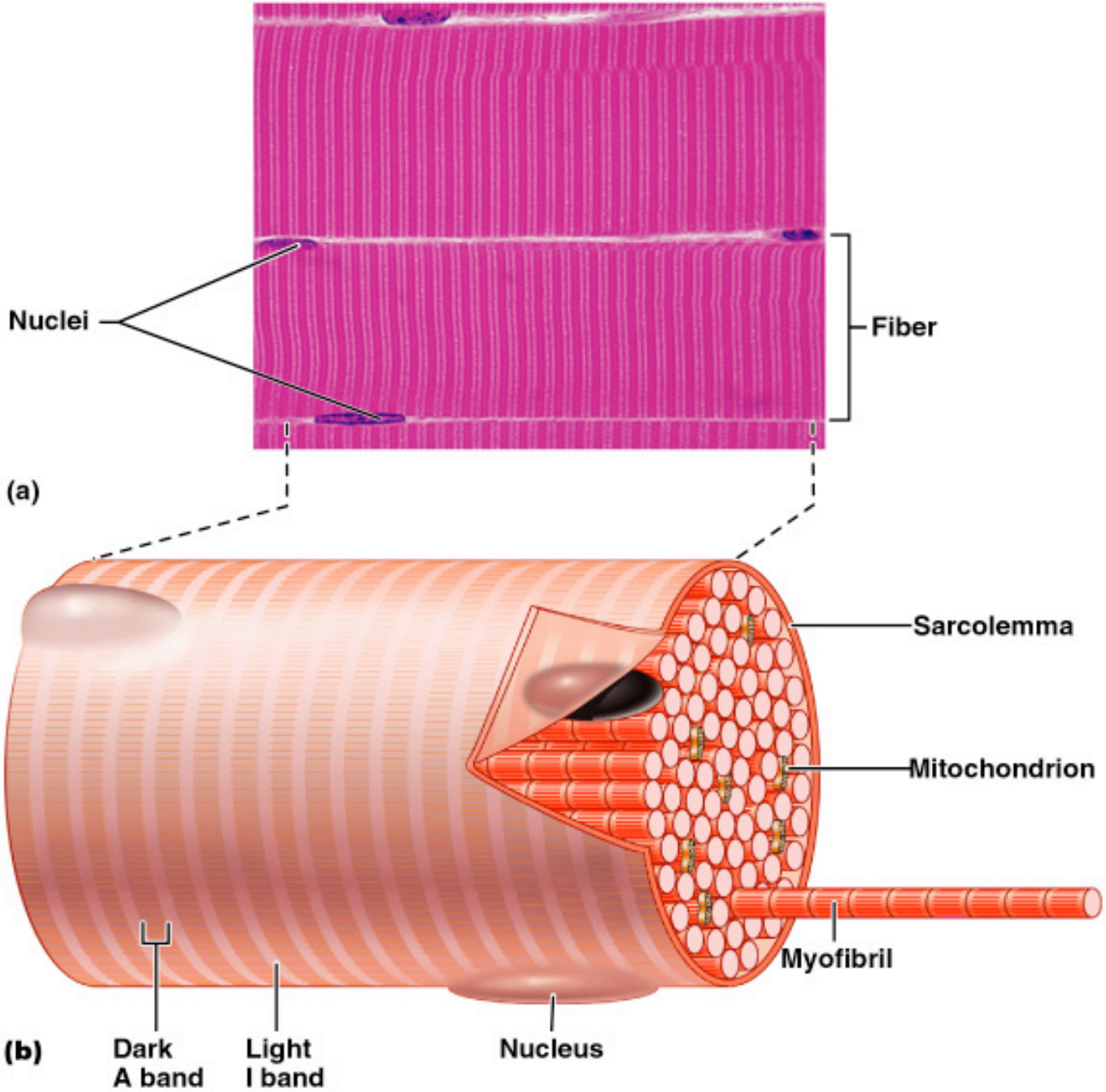


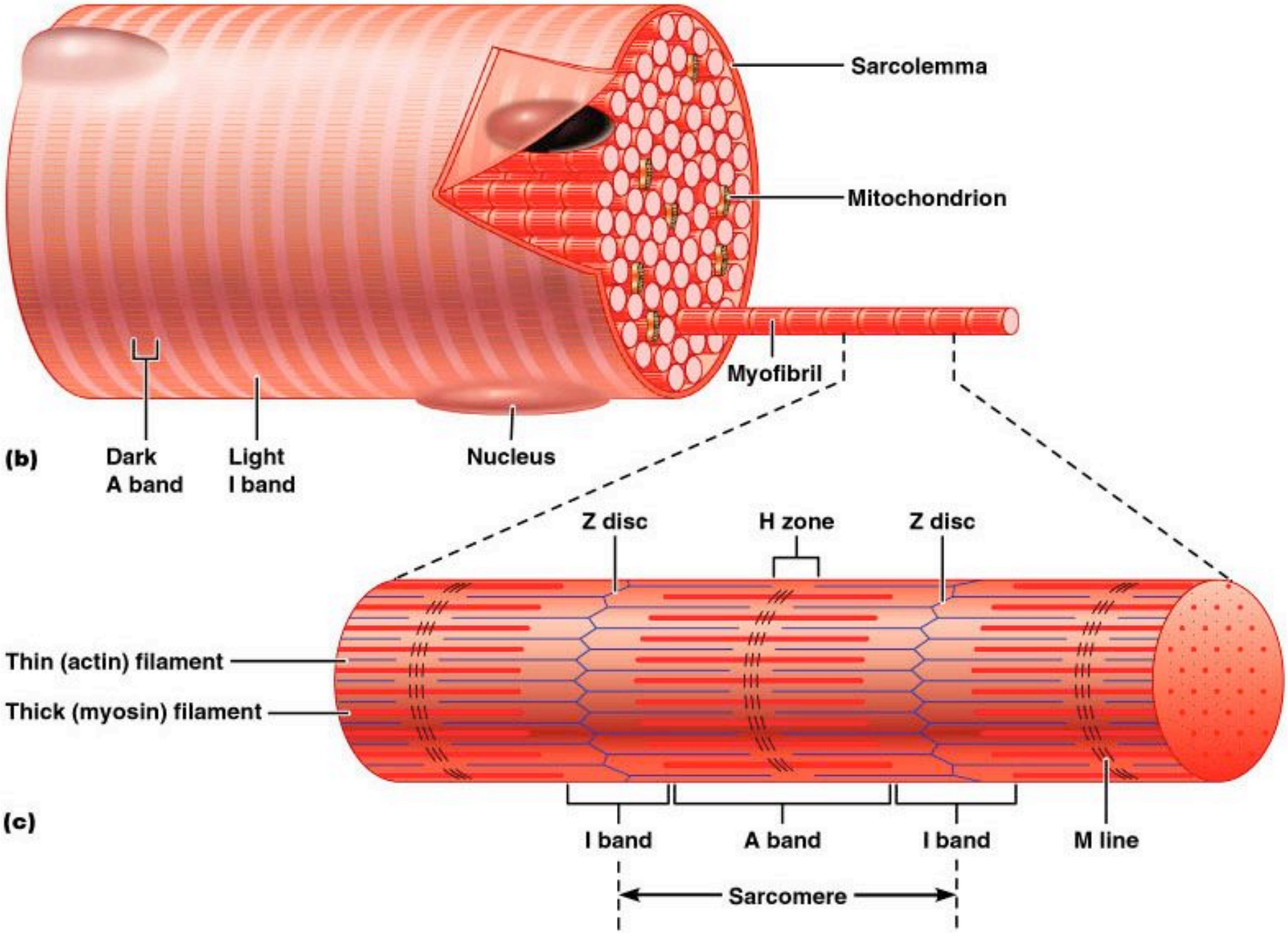
Figure 9.2

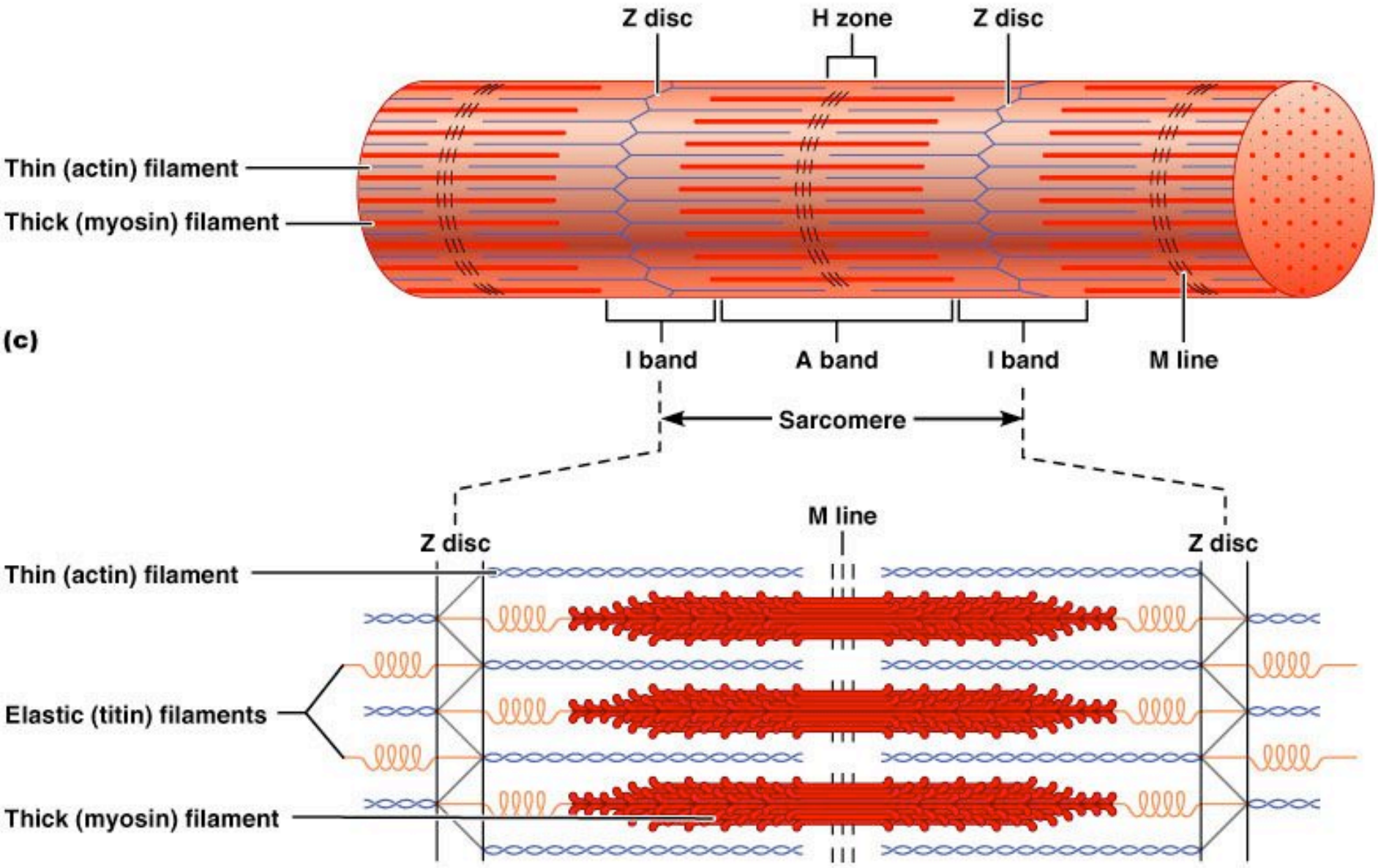
MYSTERY TEXT!!!

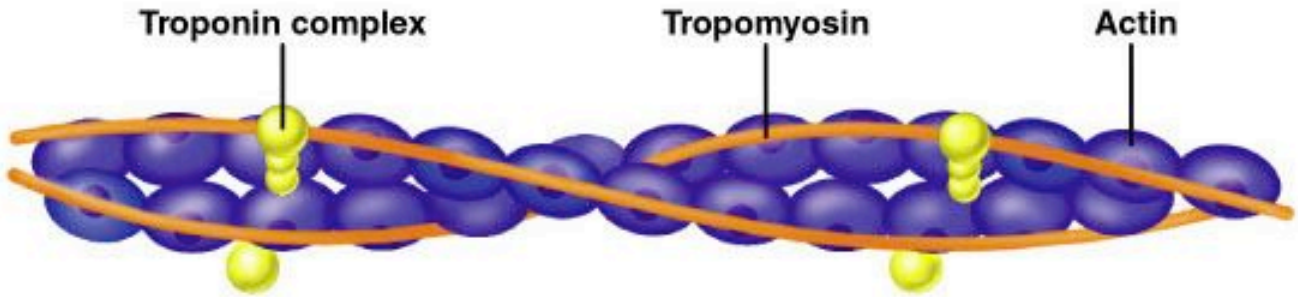


Microscopic anatomy…

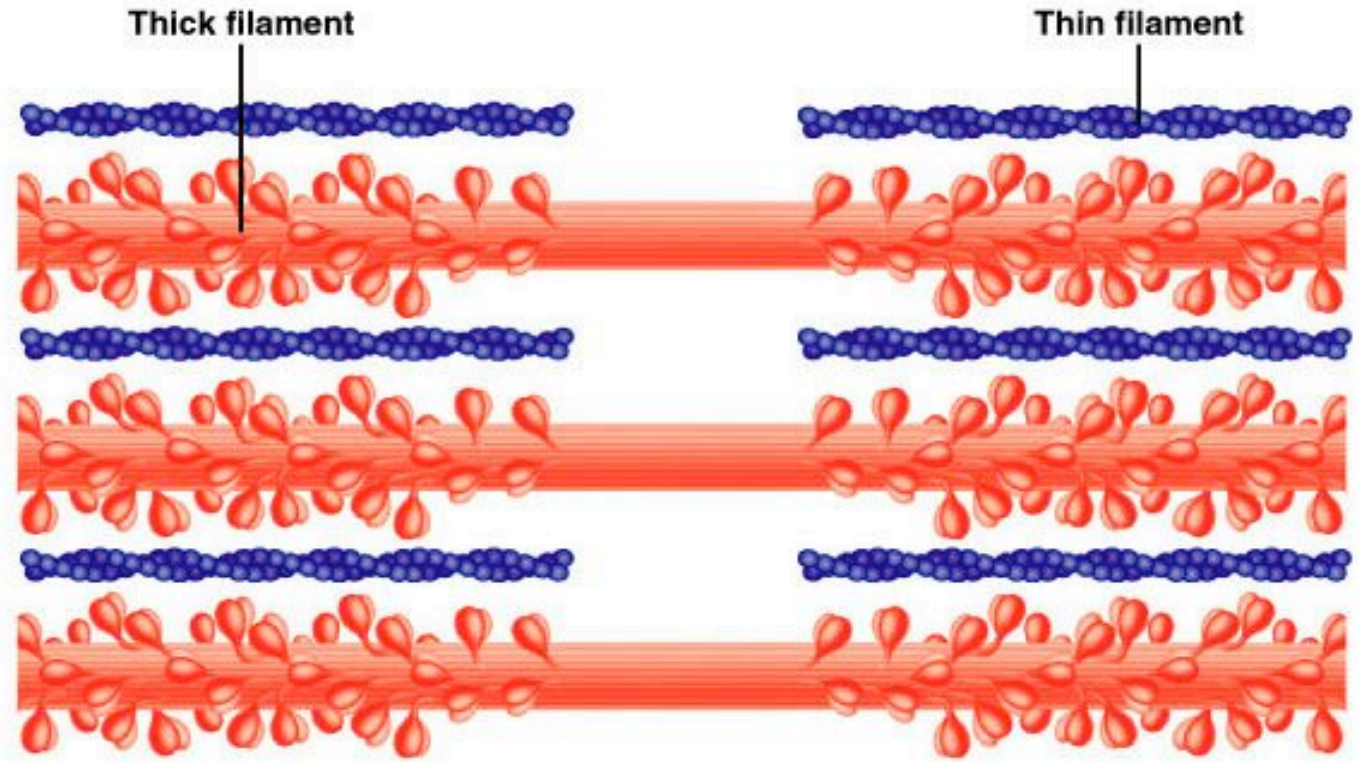




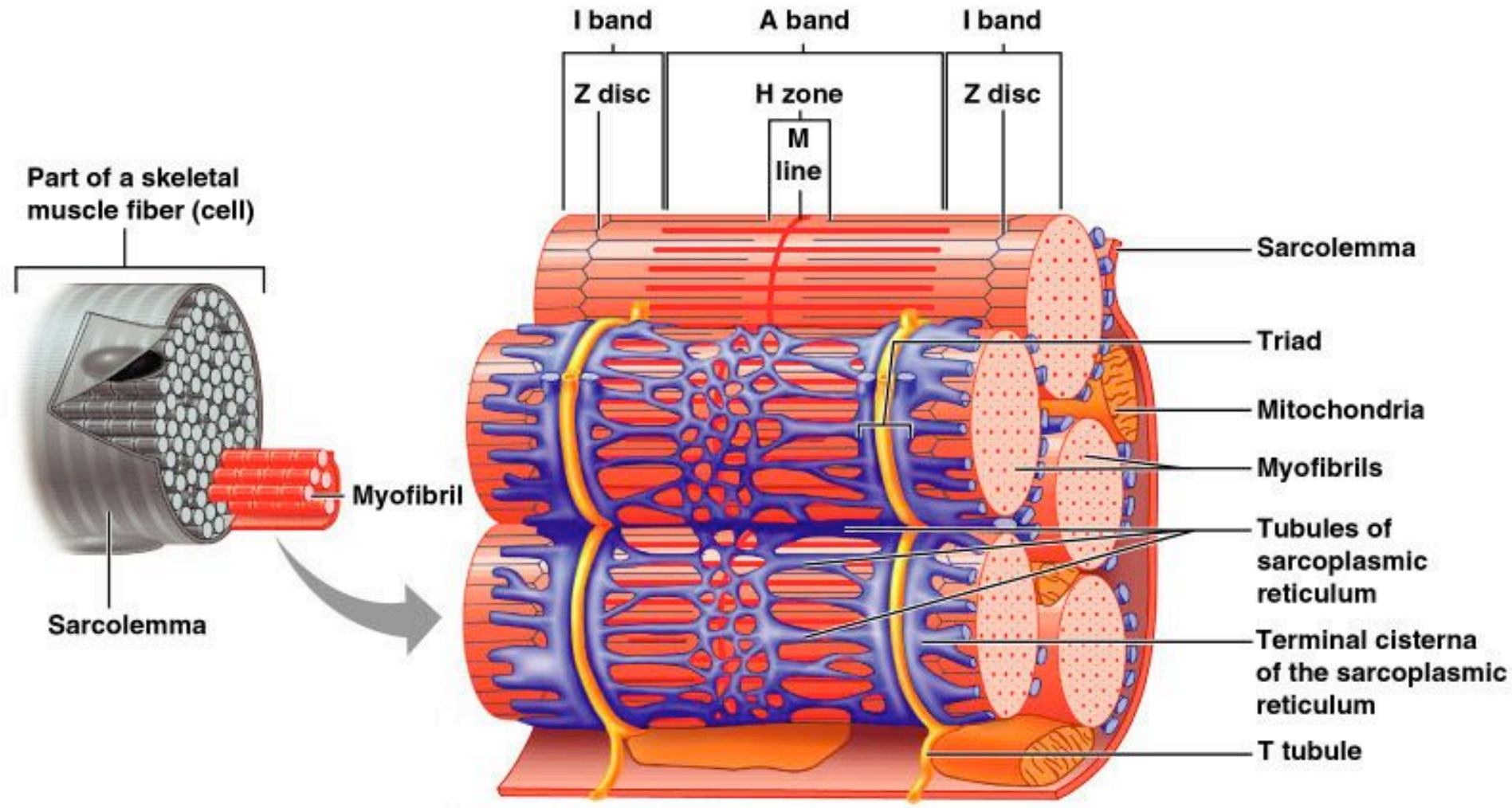




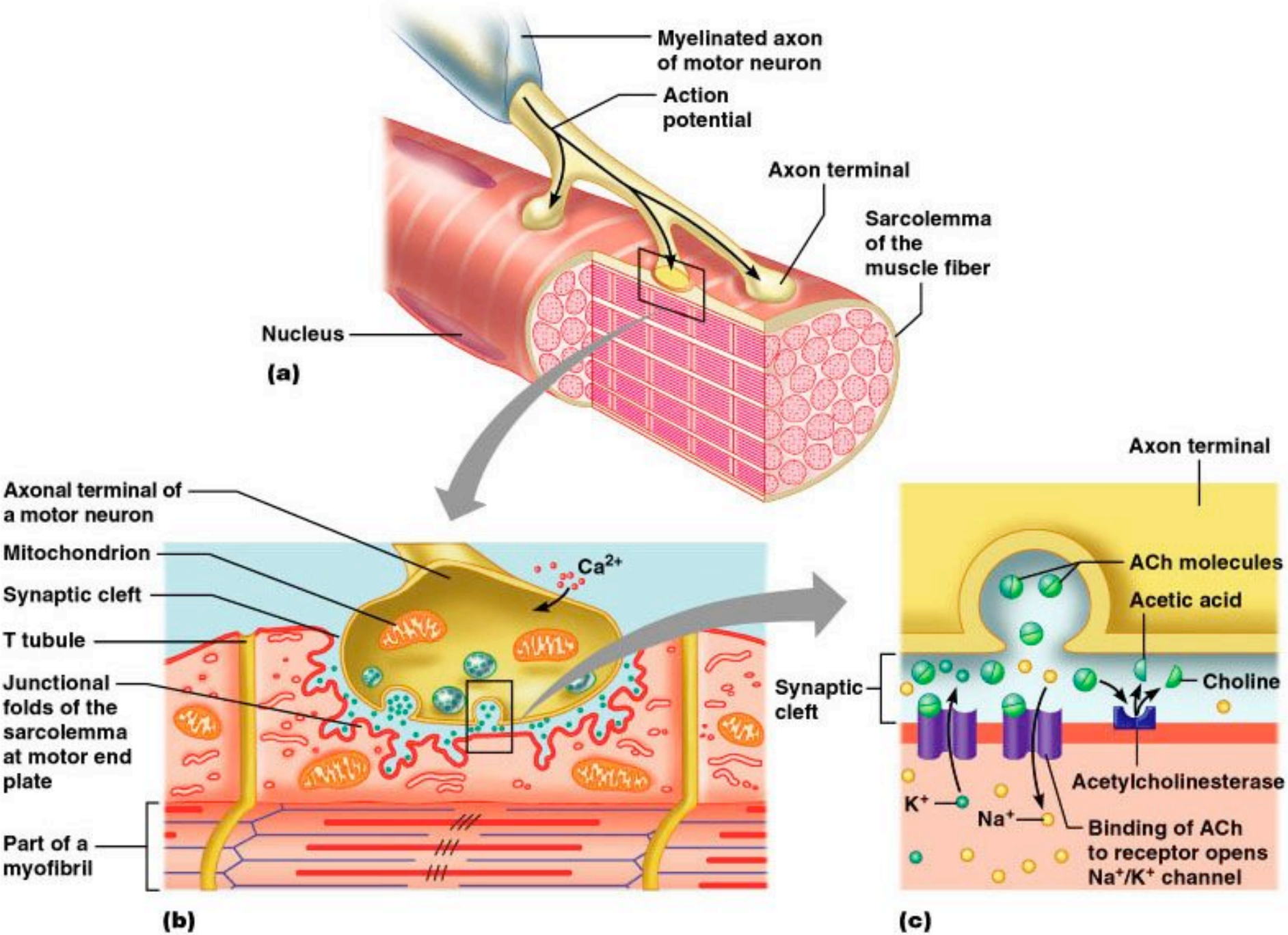
(c) Portion of a thin filament

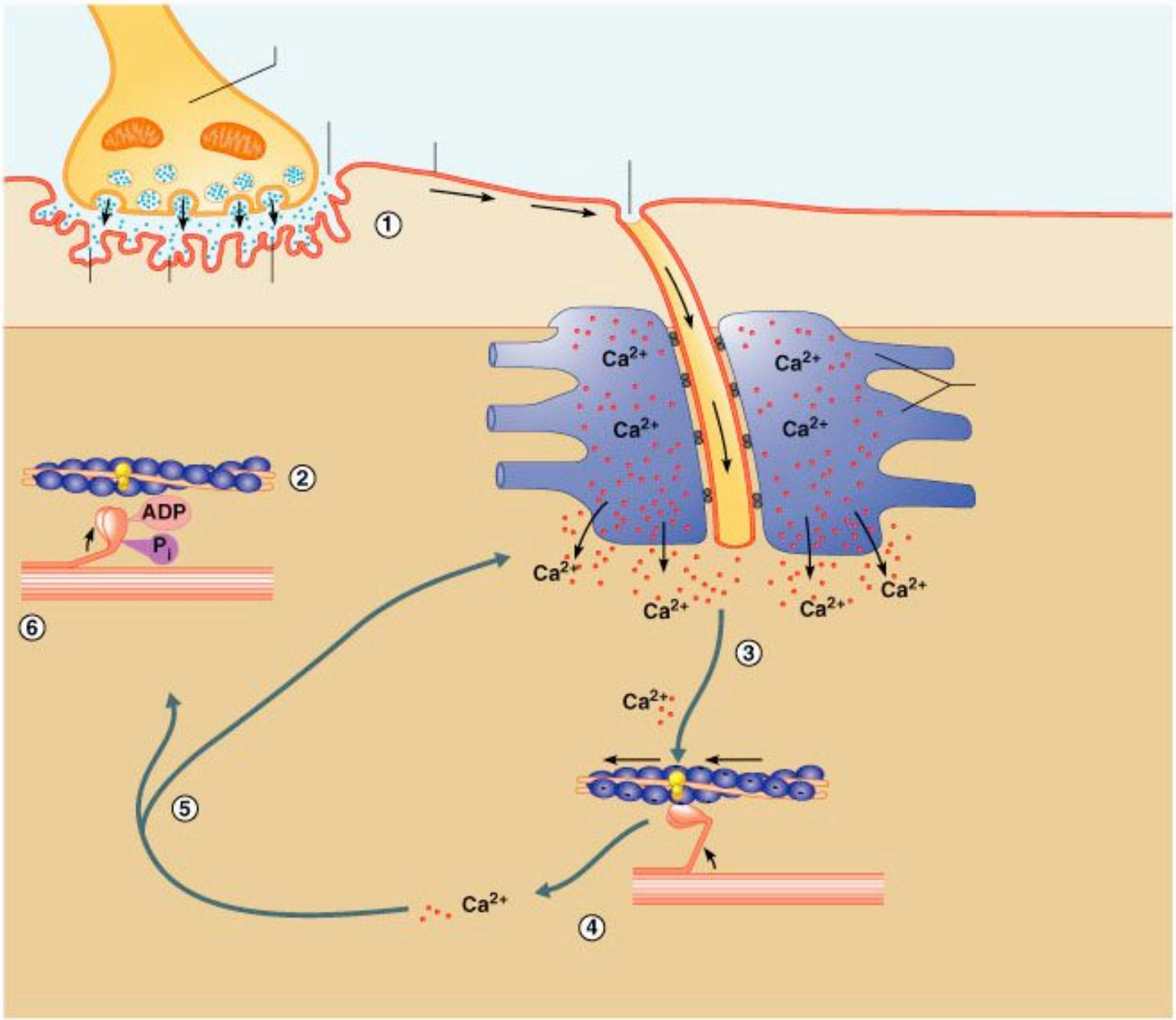


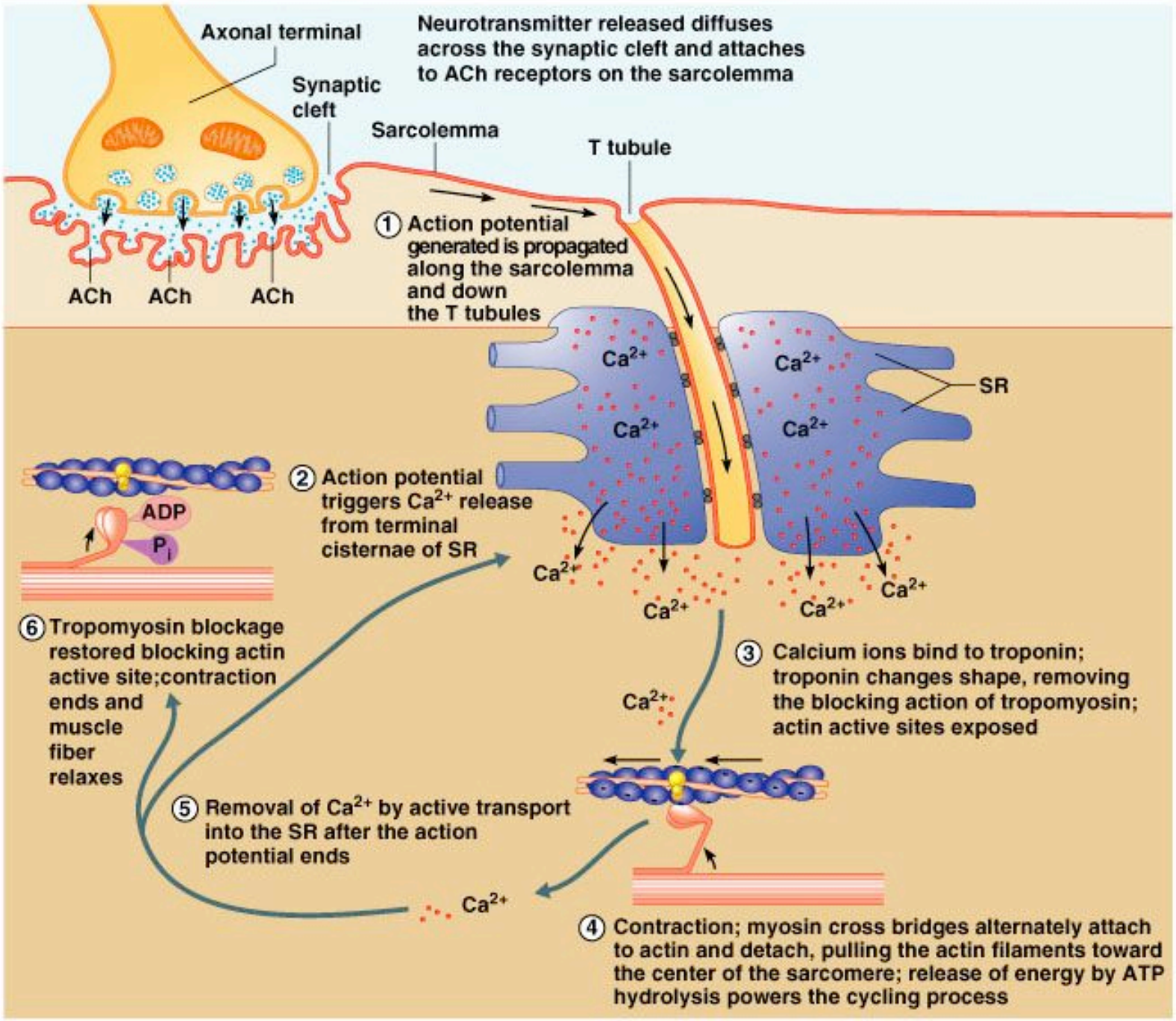
(d) Longitudinal section of filaments within one sarcomere of a myofibril



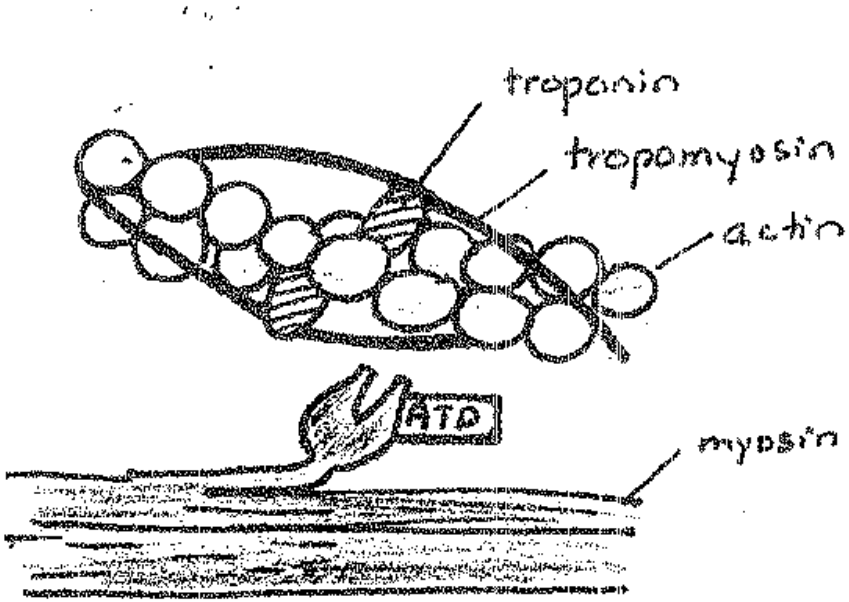
Muscle physiology: How it all happens…







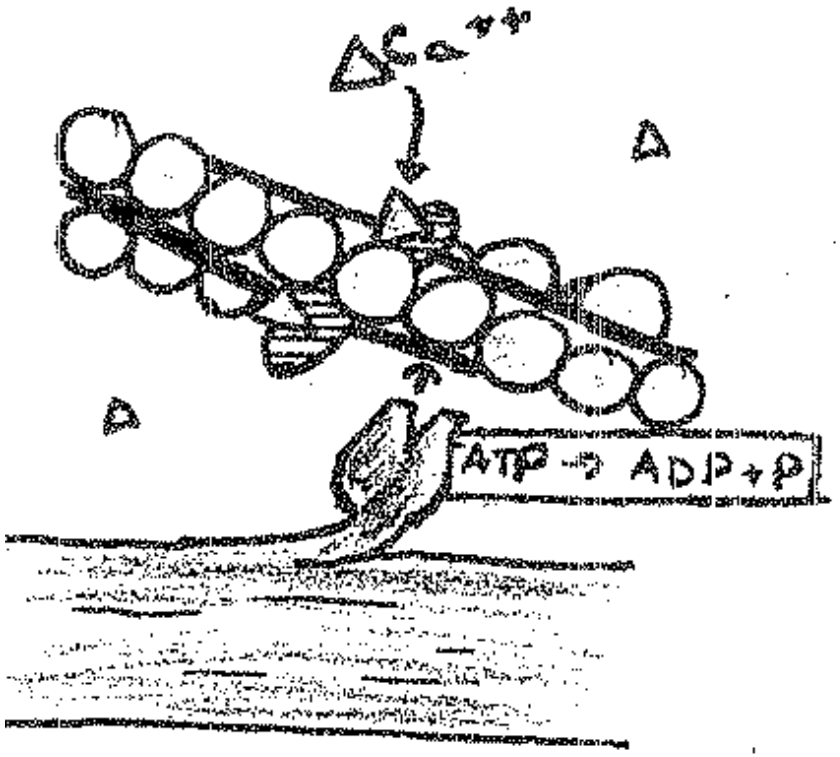
Sliding Filament Theory



Resting:

- ATP is attached to myosin cross bridge
- Actin active sites covered by tropomyosin
- Troponin holding tropomyosin in place

Sliding Filament Theory

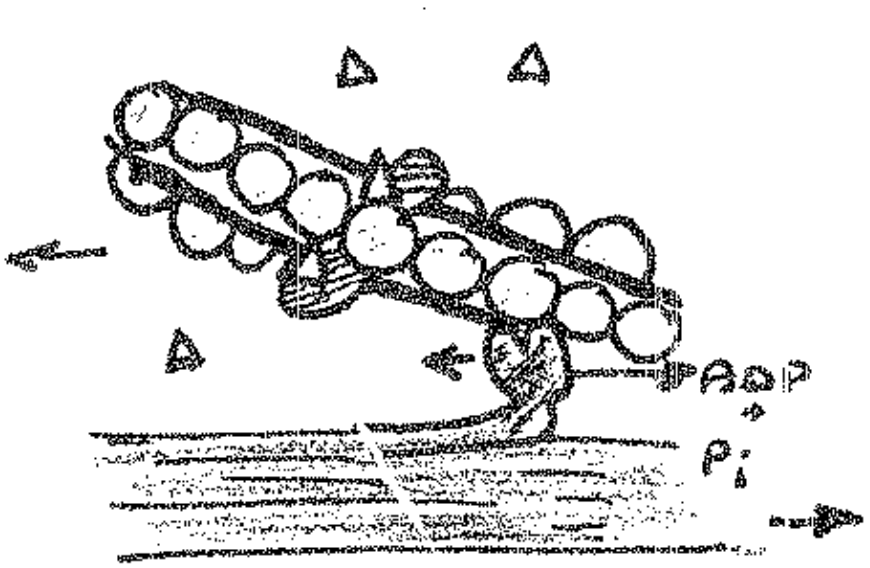


Stimulus causes Ca++ to be released.

Ca++ binds to troponin causing tropomyosin to sink move revealing active sites on actin

ATP→ADP & P (which causes the head to change positions attaching to actin)

Sliding Filament Theory

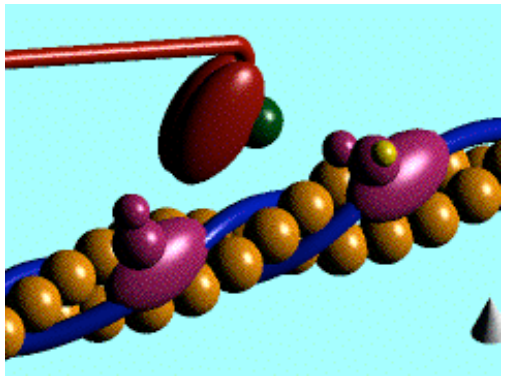


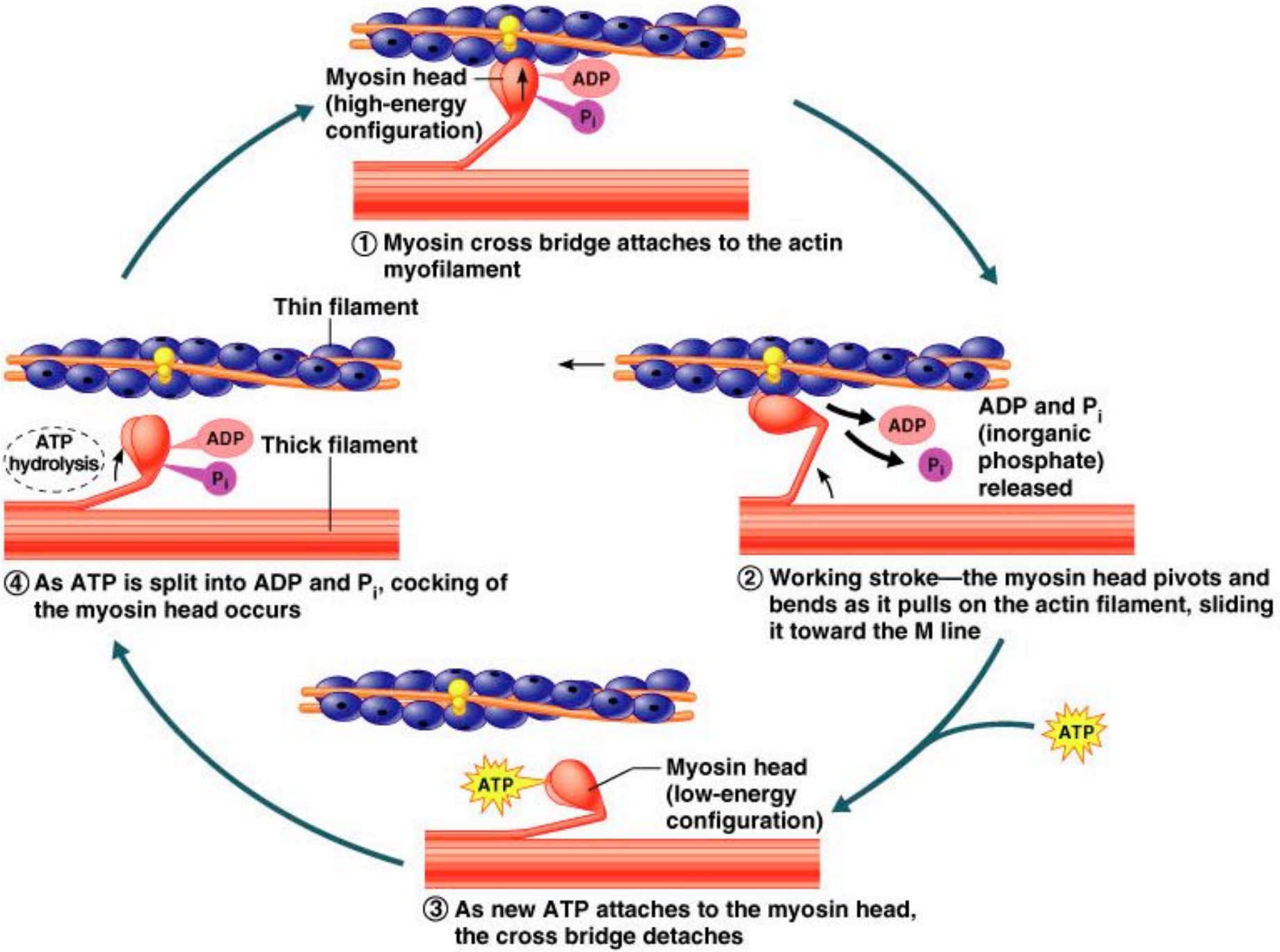
ADP & P are released.

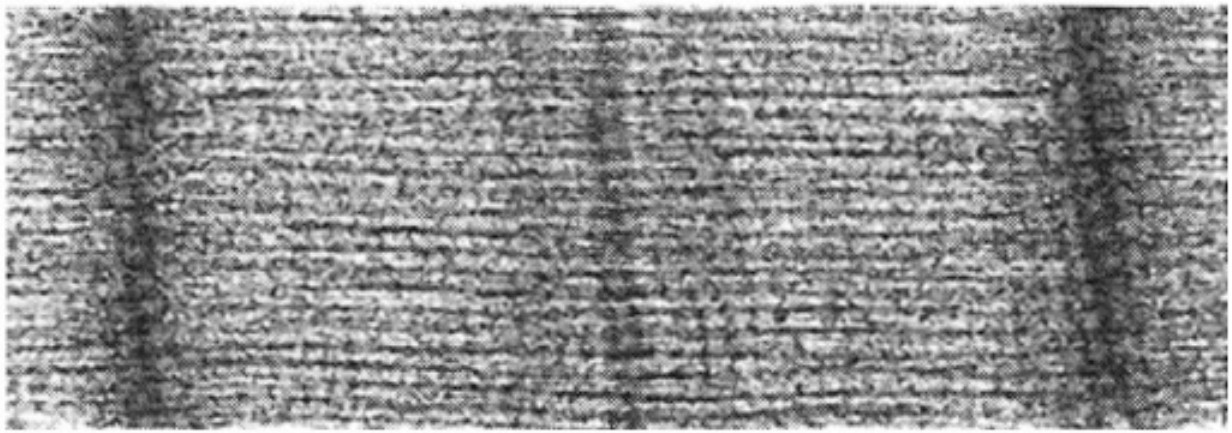
Power stroke: myosin head pivots causing the thick and thin filaments to slide past each other.

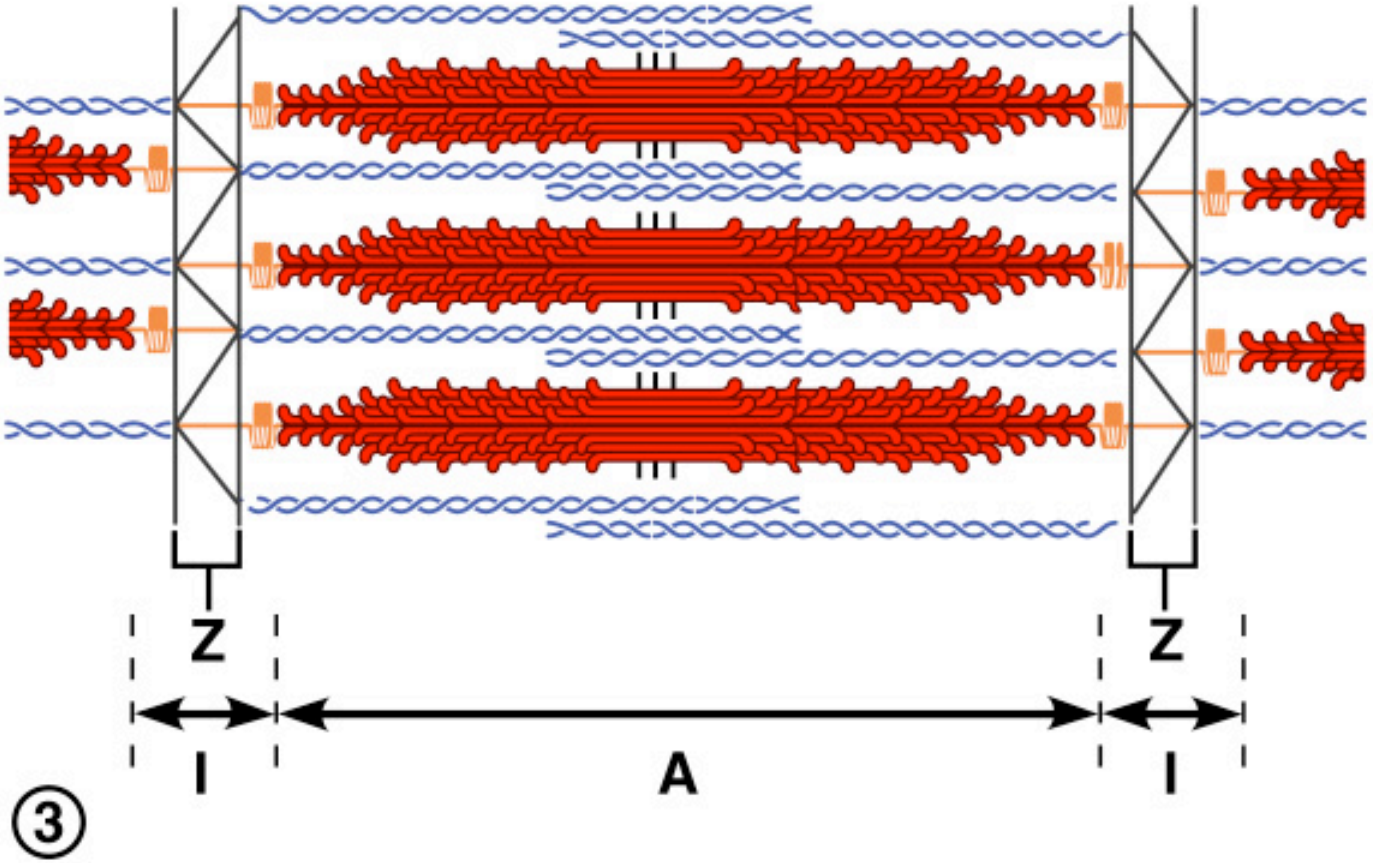
ATP attaches to myosin returning it to the resting position

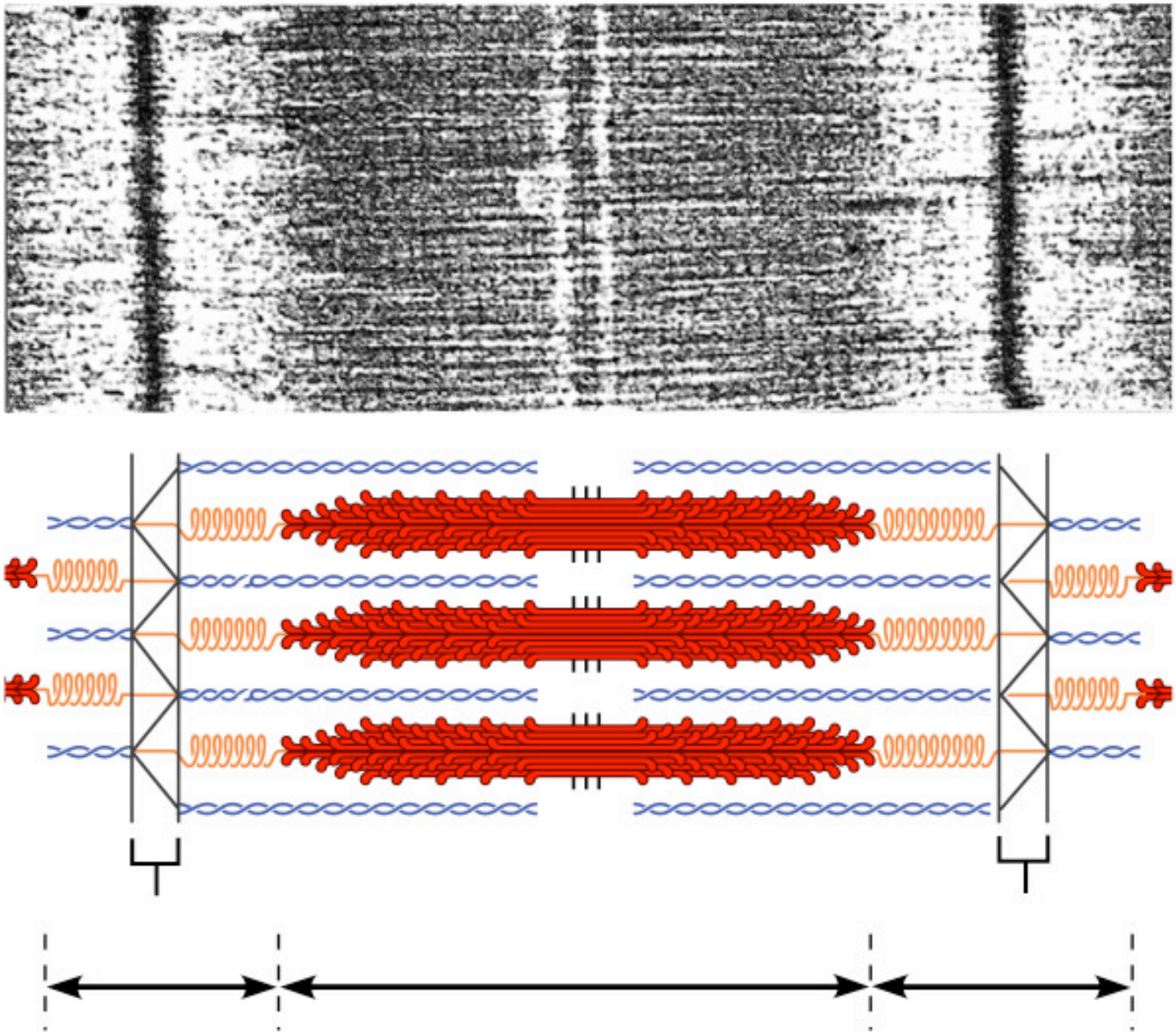
Animation with quiz











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