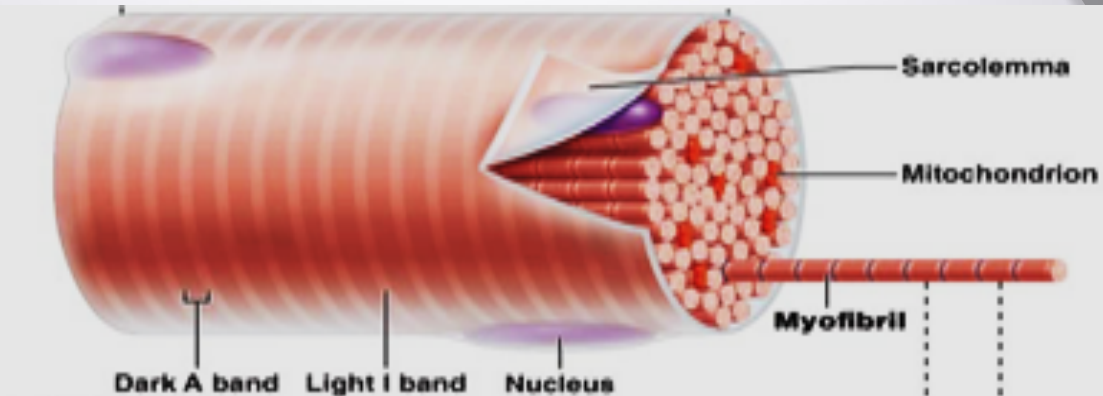




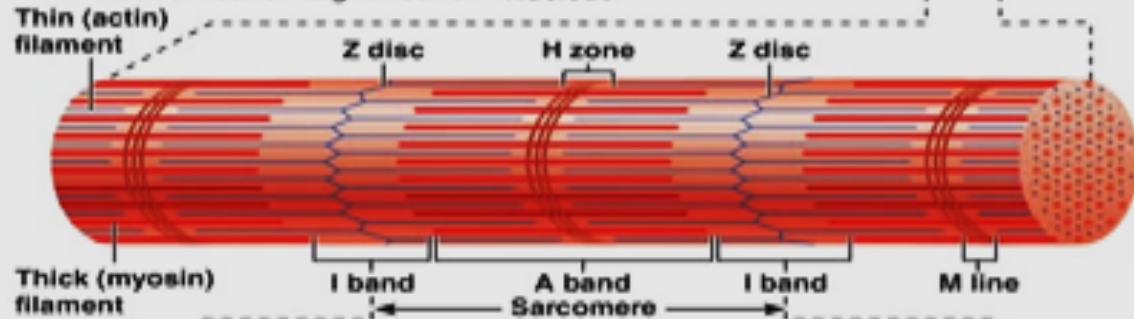
EXCITATION – CONTRACTION COUPLING.

Prof. Sherif W. Mansour
Physiology dpt., Mutah School of medicine
2021-2022

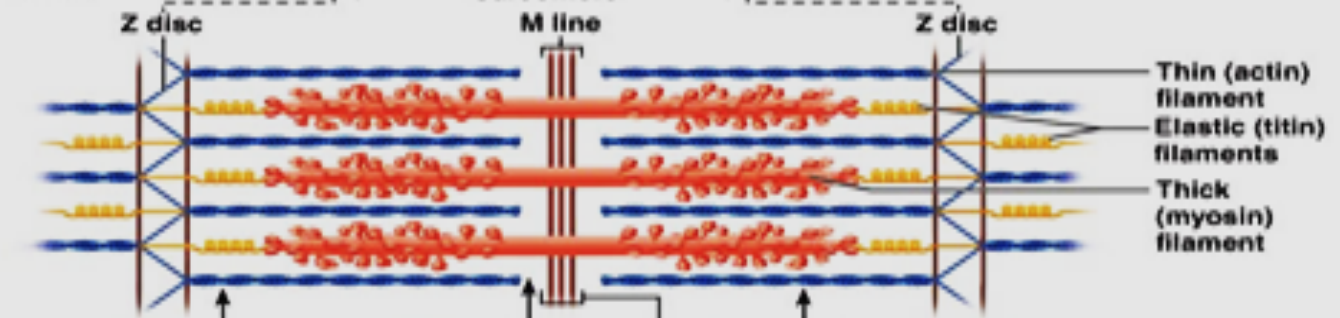
(b) Diagram of part of a muscle fiber showing the myofibrils. One myofibril extends from the cut end of the fiber.



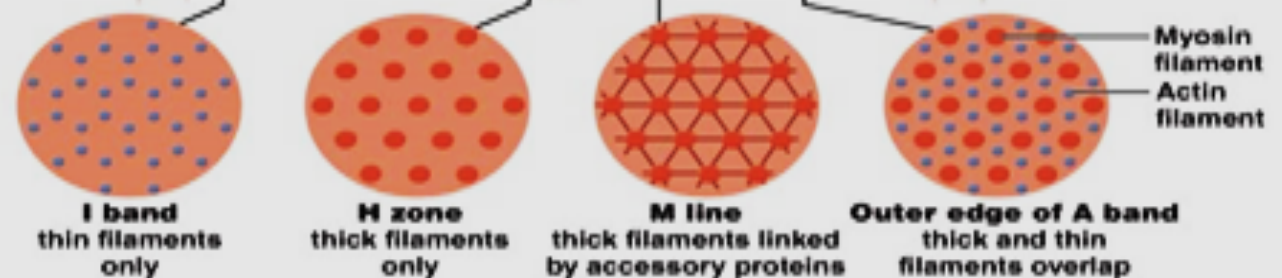
(c) Small part of one myofibril enlarged to show the myofilaments responsible for the banding pattern. Each sarcomere extends from one Z disc to the next.



(d) Enlargement of one sarcomere (sectioned lengthwise). Notice the myosin heads on the thick filaments.



(e) Cross-sectional view of a sarcomere cut through in different locations.



Muscle proteins

[A] Contractile proteins:

1- Myosin: -Myosin is complex protein with M.W. 480,000.

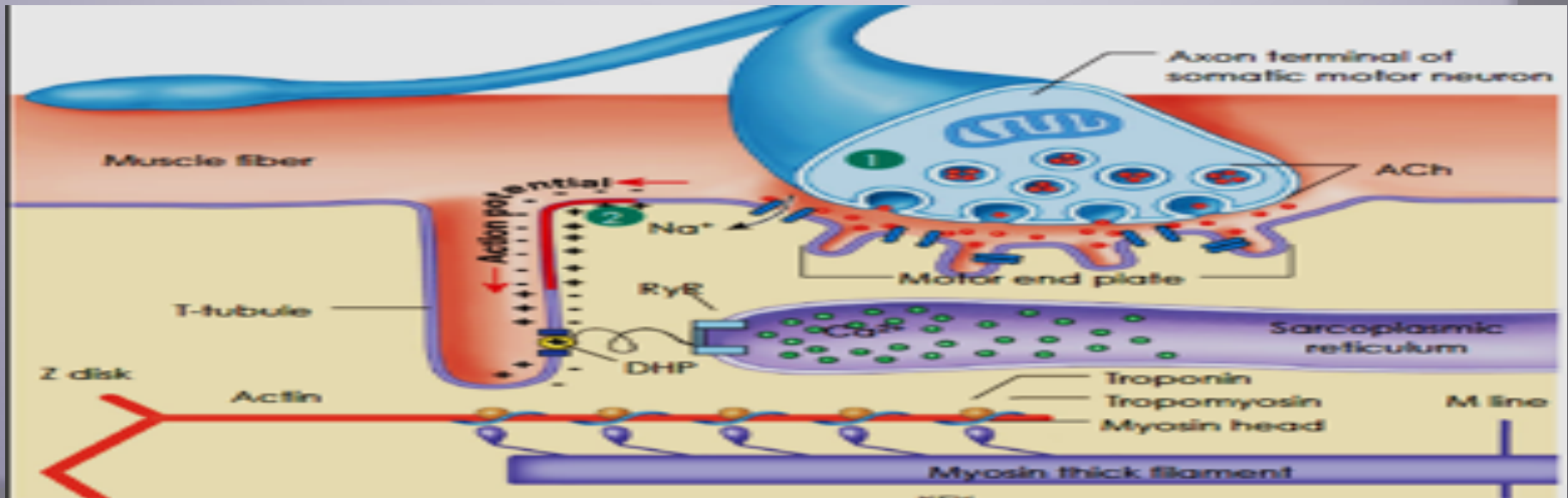
-Composed of 6 polypeptide chains (2 heavy chains and 4 light chains).

-The 2 heavy chains wrap spirally around each other as double helix forming long tail (light meromyosin) and arm (heavy meromyosin) while the terminal part combine with the 4 light chains forming 2 globular heads ,one head contains actin-binding sites and the other contain sites of ATP hydrolysis.

-Cross bridges arise from the head with arm of 2 flexible points called hinges (one between arm and tail and the other between the arm and heads) to bind to the actin.

2- Actin: - It is small globular protein with M.W. 42,000.

- The globules attached to each other to form filamentous structure arranged in two chains as long double helix.



[B] Regulatory protein:

1- Tropomyosin:

-It is long filament of two polypeptide chains twisting on each other and located between the 2 chains of actin covering its active sites which combine to myosin and keeps the actin structure.

2- Troponin:

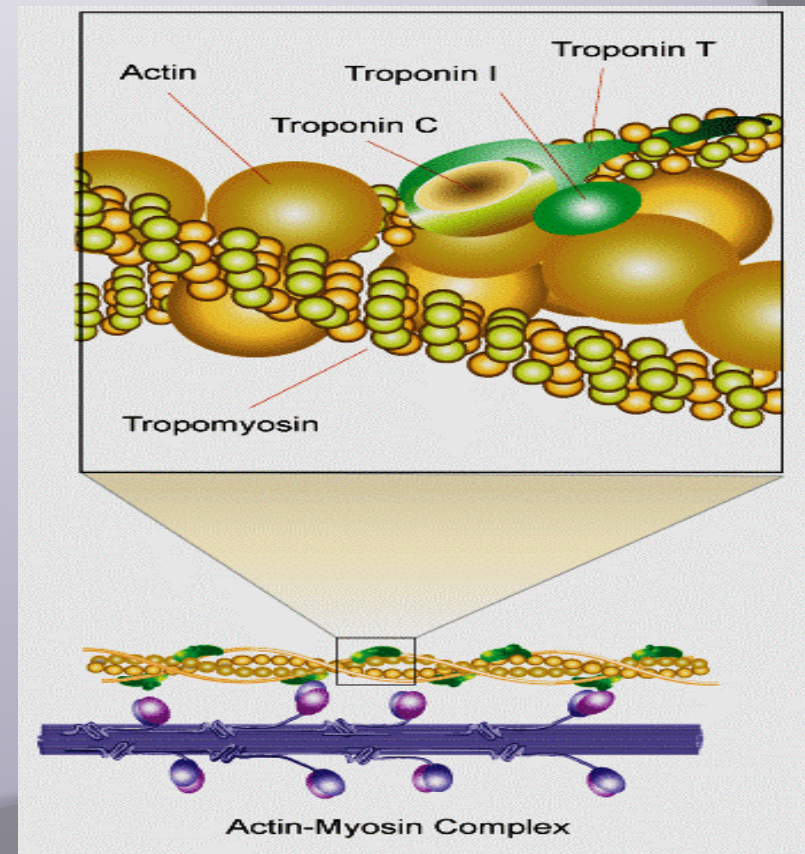
-Small globules located at intervals along tropomyosin.

-Of 3 subunits with MW 18,000-25,000.

1-Troponin T: binds troponin to tropomyosin.

2-Troponin I: inhibit binding of actin & myosin.

3-Troponin C: bind Ca^{+2} ions \square contraction.



Thank You